Bob Cooper's

OCTOBER 15 2003

SatFACTS

MONTHLY

Reporting on "The World" of satellite television in the Pacific and Asia

IN THIS ISSUE

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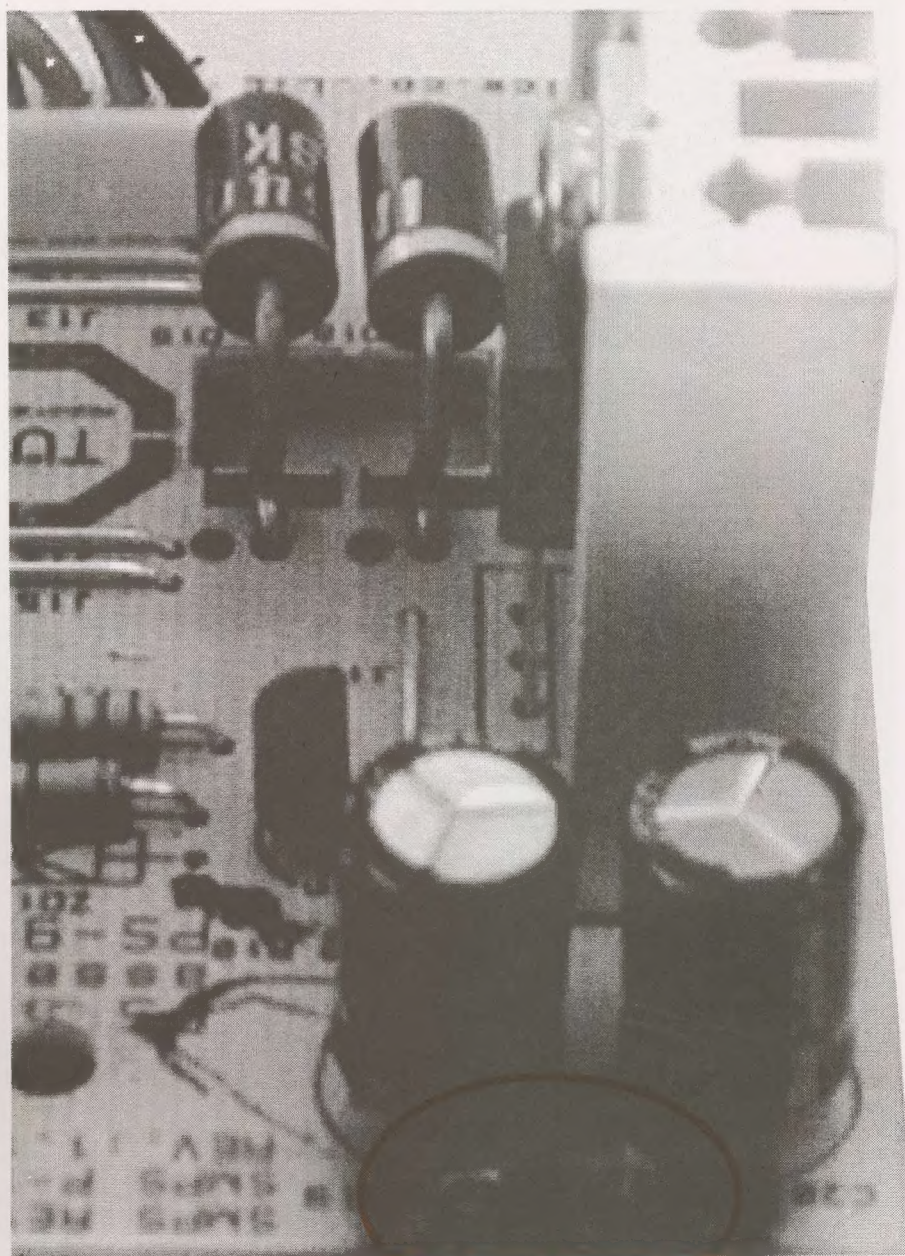
Krispie Kritters are back!

SatFACTS
MONTHLY

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This publication is dedicated to the premise that as we are entering the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install the appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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our TENTH year!

COOP'S COMMENT

October 15, 2003

When I was a mere lad of 12, my father hauled home from a business trip a 7" Hallicrafters TV set. It was 1950, and we lived in Ithaca, New York where a single TV station from Rochester, New York - 100 miles distant - was available, *provided* we were willing to put up with heavy doses of snow, fading, and a TV broadcast day that began at 4PM and quit before 11. Through the ensuing 53 years, I've been there, often in person, as each new television delivery scheme came onto the horizon. First there was cable, then UHF, VHS tape, followed by C-band satellite followed by Ku DTH and then DVD. A long-worked upon book detailing all of this from 1950 to the present is past 400,000 words and growing; a "tome" I anticipate finishing before year's end.

Now, a new delivery method, one that will surprise few and amaze only those who still watch TV (as I did in 1950) from a rooftop aerial. *Internet delivery of TV*. From anyplace on our planet to essentially any other spot.

Internet TV has been with us in varying levels of *degradation* from at least 1993. What has been missing is glitch-free, natural motion, quality colour TV on a full computer PC monitor screen. Or, Heaven-forbid, patched to a TV set through the A-V RCA sockets or S-VHS socket. Internet television has until very recently been (a) very slow (taking perhaps ten hours to download an hour of material), or, (b) in "real time" *but* badly flawed with video and audio artefacts that detract from enjoying the content.

Wait no more. *It is here*. Provided? Provided you have a minimum of 256 kbps full time service (384 is better, but not much). If there is one essential ingredient in "TV via Internet" it would be, as an absolute minimum, full time, real connection to a service capable of sustaining 256 kbps into your PC. In some fortunate locations, 256 "thruput" is available for a price; services such as New Zealand's Telecom offer "Jetstream" (or whatever they call it locally) but only limited downloading for a base fee in the region of $60-80 (local currency) per month. An hour of ho-hum TV will pretty much wipe out your not-so-generous monthly allocation of "base time." Downloading a full length Hollywood film could easily cost you more in thruput/downloading time than going out to the corner store and buying the film over the counter. So when New Zealand's Walker Wireless announced "uncapped" charges (no limit on thruput) for 256 kbps delivery speed into your home or office at NZ$14.95 per week, an important threshold was crossed. The right speed at the right price. *Bingo!*

Then the University of Auckland's Brian Oliver (the "Unisat Project") announced that with the assistance of Philips NZ, students and faculty at the University, subscribing to Walker's "Whoosh!" service, would be able to acquire hardware-software to allow reception in their homes (or wherever they might be with a laptop in the Auckland region) of any of the Unisat TV channels (DW, TV5, RAI and many more). Real time TV, via satellite to Unisat in Auckland, then via "Whoosh!" to their home PC or TV set.

Philips competitor Sharp, meanwhile, is rushing to (the US) market a 15" battery capable LCD TV with a built-in WiFi receiver that arrives packed with a companion 2.4 GHz WiFi transmitter. Plug in any video/audio source (including off satellite) and tote the lightweight picture frame shaped LCD TV around your home, property or even neighbourhood.

Suddenly, 256 kbps retransmission of full motion, glitch free, total colour TV has become *respectable*, all because software algorithms have reached a new level of quality - VHS quality, yes - using a minimum of "bandwidth." It's not exactly "full colour high quality TV to your cell phone, yet, but it is edging closer to that particular nirvana every month.

Speaking of which, on September 19th I sat in Kaitaia, New Zealand in front of a Jetstream connected 450 MHz rather ancient PC and for an hour surfed through all the channels of a USA operated 250 channel cable system 8,000 miles distant, using a standard RCU. TV delivery has come a long-long ways from our first Hallicrafters 7", *53 years ago*.

In Volume 10 ◆ Number 110

Departments

-On the cover-

One percent failure rate. That's what Humax anticipates with their outside-sourced receiver power supplies. On the front cover this month - one of those that *failed*. Garry Cratt helps us understand failures; p. 19

L E T T E R S

Kudos

"In renewing for the fourth year I just wanted to say 'Thank You' for providing such a comprehensive publication. Early copies I have seen, carefully guarded by their owners I might add, were obviously slanted at the fast developing hobbyist supported spread of C (and later Ku) band services. During the course of my three full years, I have witnessed a carefully planned maturing to 'the business' of satellite. At the same time, SF's pioneering developments in areas such as 2.4 GHz linking maintains a leading edge approach for hobbyists as well. I always learn something important in each issue; keep up the effort."

BK Gill, Sydney

Nothing about this technology stands-still for very long and that alone is our incentive to continue our approach to changes taking place all around us.

Looking for help

"My name is Peter Ludeman and have been talking with my friend John at John's Electronics regarding some contacts in New Zealand on behalf of a firm called eSat Communications Pty Ltd. They are searching for capable installers of 0.9 - 1.8m VSAT terminals throughout New Zealand. Can anyone help?"

Peter Ludeman, tel 00 61 408 505 695

SMA

"The first analogue mobile cell fones used SMA fittings, later TNC. I have SMA here, SMA to TNC adapters, and the SMAs 'crimp on'!"

Al, NSW

DGT400 scrap?

"I have been offered a quantity of Pace DGT400 IRDs and understand they were taken out of service by Austar. Is there a market for these anyplace in the world?"

Gary Stone, C.W. Technology Pty Ltd.

No place in the world. When the last big transition occurred (Australian RABS replacement of B-MAC analogue with MPEG-2) more than 10,000 SA/Plessey receivers went largely to the tip. Garry Cratt "rescued" several hundred and offered them for $25 each and then ultimately free for the taking. Old technology (such as the DGT400 era) simply fades into the sunset. Even the "raw parts" if removed from the circuit boards would cost more to reclaim than the marketplace would pay for parts. Fine for a hobbyist, perhaps; no commercial value.

"DGT-400s no longer work on Foxtel because Fast-I is gone. These IRDs require Parental Guidance info to be present or they won't work. Anyone know where to locate original Pace software to 'fix' this quirk so 400s can be used for C-band or other FTA viewing?"

RW, NSW

PROGRAMMER PROGRAMMING PROMOTION UPDATE

OCTOBER 15, 2003

Aurora cards: 5 years and counting. Optus announcing they will end use of Irdeto Version 1 encryption (and cards) not later than the end of 2008. Replacing Irdeto will be "MYCRYPT" which is being added to Irdeto 1 in a simulcrypt (two simultaneously). What about existing "lifetime" card users of Irdeto? Optus does not explain but notes there are 40,000 present users of which they claim 32,000 are RABS (rural area) TV and radio users. Optus mentions, "MYCRYPT has the advantage of being more secure and will decrease the incidence of signal piracy." Optus Irdeto cards dried up during August and September with the explanation that existing Irdeto format "Version 2 cards had not become available prior to the exhausting of V1 supplies." Sciteq Pty Ltd. advises, October 1, MYCRYPT cards are now available (MYCRYPT being Irdeto V2). And, for now, until 2008 or a new Optus decision - whichever comes first - existing Irdeto V1 cards will continue to function. Sky (racing) service, moving to Optus B3, has been hit especially hard by card piracy. MYCRYPT is Mindport encryption - and Mindport owns Irdeto; *Irdeto V2 in drag.*

Not what you think. "Mix 106.3" SCPC Canberra radio station (B1, 12.574Hz, Sr 1.851, FEC 3/4 with audio PID of 1063) sounds like very poor quality radio. But when you analyse the data stream, it is "very busy" - far too busy for the radio it claims to support. Actually - the data stream is around 5-8% radio and the balance (and majority) is ... well, data. What kind of data? You are on your own on this one! One clue: the "Mix 106.3" is a cover, a deliberate attempt to "hide" the real content. There are others as well, "hiding:" Teletext PIDs activated on services such as Showtime are not what their "label" declares!

Digital radio in Australia? Tests began mid-September, Sydney, of L-band (1.48 GHz region with two transmitters; North Sydney and Parramatta) and on TV channel 9A in the Band III VHF spectrum to compare reception results. Both transmitters are using Eureka 147 digital audio parameter system, already widely used in UK and portions of Europe, with a data handling capacity of 64 kbps "on top of" the 256 Kbps for each radio channel. Britain's VHF (200 MHz region) service is already well entrenched - receivers have dropped from A$2500 to under A$200 and the expansion of new transmitters now underway will bring "CD quality digital radio" to more than 85% of the UK by early in 2004. L-band requires more expensive receivers, coverage is much smaller per transmitter (typically under 20km versus 80 km with VHF). Naturally, existing AM and FM broadcasters are made nervous by all of this. SatFACTS #106, 109 explored the WorldSpace L-band satellite to ground service.

256 glitch-free TV anyplace, via Internet? Coop's Comment (p. 1) suggests a new level of hard+software now undergoing "Beta-Test" could be a copyright-legal system capable of extending your "bedroom" thousands of miles from your actual home. Satellite? SF checked with Steffen Holzt who advises, "PAS-2/8 can deliver 256 24/7 to any Pacific location for satellite costs of around US$900 per month." Translation? If you lived in American Samoa (part of the US copyright jurisdiction) you could have "bedroom TV" from "the mainland" for a fee many would consider "do-able."

"That cover"

"Bravo for placing Gay on the front cover; it was long overdue!"

Garry Cratt, AV-COMM Pty Ltd.

"Delicious!"

Kenny Schaffer, New York, NY

"The most rewarding 'comments' in SF September were your words of special tribute to your supportive mate Gay - something not often found today or rarely admitted by a bloke. Pat yourself on the back!"

Stu the Satellite Man, NZ

"Coop's Comment reveals more about your family than I (and I suppose everyone else) have known before. Such openness is refreshing - and fills a few gaps for me. I'm taking it home for my own Superwoman to read."

Peter Lacey, Laceys.tv

"Please QSP my regards to Gay and be sure to tell her to kick you in the bum for not having sorted out that LNB on your own - sheesh!"

BG, Hong Kong

"Pills?"

IF, Queensland

"As long as Gay is on the 'pill assignment', I know we are in good hands!"

Nigel Clough, NZ

Coship in South Africa

"I contacted DMS International after reading your article on the Coship 3188C. There, manager Tim Heinrichs informed me this particular model was in fact a 'one-off' and is no longer in stock. I understand another blind search model, from Satworks, remains available."

Chris Moore, South Africa

Satworks? Powtek? Innovia? One-off??? The mystery deepens as we relate on p. 31, here.

Distribution

"Can SatFACTS provide some updated information on the proper techniques for distributing off-air VHF and UHF services to multiple outlets in a home when both analogue and DVB-T reception is desired? I am confused by the different 'advice' one receives concerning use or mastheads and appropriate levels to each TV set connected to the distribution system."

Charles B, Melbourne

We can and will in future months. Perhaps the most crucial design parameter is to keep overall output levels from an amplifier (whether a masthead or distribution amplifier) to 80 dBuV maximum for digital. In most areas where analogue and DVB-T are now operating in Australia, the analogue peak sync tip levels average 10 dB higher than the lower powered digital. And different digital set-top boxes have varying overload problems when presented with 'too much signal'. Distribution amplifiers should at the very least have separate gain controls for VHF (bands I-II-III) and UHF (bands IV, V).

Optus Whizzes?

"Back in June I rang Optus to congratulate them on the launch of C1 an hour after the successful lift off. The 'mushroom' on the phone told me I was mistaken, the satellite would not 'go up' for several more hours. Wrong!"

DN, NT

HARDWARE EQUIPMENT PARTS UPDATE

OCTOBER 15, 2003

UK's CAI (Confederation of Aerial Installers) conducting detailed analysis of existing DVB-T (terrestrial digital) aerials, will rate antennas available as guide to installers and consumers making transition from analogue to digital. With more than a million installs to date, CAI believes it has sufficient raw data to guide future installs. UK experience emphasises critical need for selection of appropriate antenna for each geographic area "There is no one size fits all" antenna system they find. In 10-point list of must do steps they include, (1) Antenna directivity is more important than gain, (2) Use portions of building such as chimney or gable peak as "shield" against interference, (3) always use coaxial cable downline with two earthed screens, (4) use only fully screened wall outlet plates, (5) do not attempt installs without digital-specific signal level and quality meter, (6) do not over drive STBs (80 dBuV maximum recommended), (7) be wary of masthead and distribution amplifier maximum output capabilities - amplifier generated interference (cross or inter modulation products) is especially troublesome for DVB-T, and, (8) be prepared to trace sources of interference from household appliances - thermostats, fish tank heaters, variable lighting controls are especially troublesome.

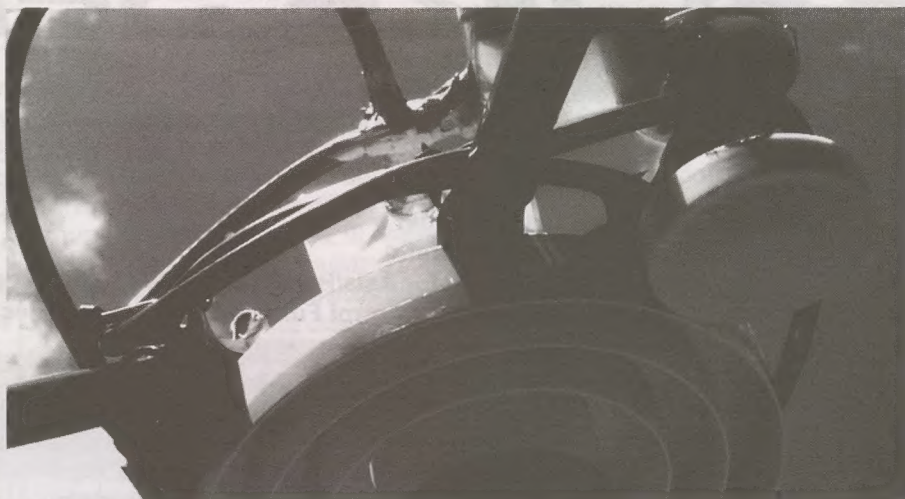
Professionals. Those who install home dish systems in this part of the world, and nothing more complex, are basically the "grunts" of an industry. Sitting at the top if the pyramid are that tiny handful who have stepped up to V-SAT terminals for professional and educational clients. One installer with 40 V-SAT sites in and operating believes the future of this sort of business, for rural New Zealand, is much brighter than the present. For example, while V-SATs play in NZ almost exclusively on Optus B3 (using 1.2/1.8/2.4m Prodelin "spoon" antennas), the new Thailand funded IpStar satellite when commissioned will have serious potential to compete with the Australian footprint. Well, maybe. IpStar will arrive into Kiwi-land in the 17 to 20 degree look angle region (52-53 dBw hoped for). Beta tests for IpStar have been paper-planned but it is difficult to correctly judge the potential of an individual site when you are in Bangkok and the site is located at the bottom of a gully behind a land reserve in Wellington (from which even "seeing" Intelsat straight to the north is a challenge). New Zealand's government is keen to promote V-SAT links for rural areas, even at the $6,000 range price tag. But the learning curve ahead, even for the professionals, will be a steep hill to climb.

Clarifying 2.4 GHz. Mark in Honiara, Solomon Islands asks, "I have acquired a license to transmit television and need some professional advice on reaching maximum distances with perhaps AUD$2000 invested in the transmitting equipment." Answers: Mark indicates his license allows operation on frequencies other than 2.4 GHz which immediately suggests low power UHF (bands IV and V) rather than S-band. Why? A UHF modulator "fed" by satellite, tape or DVD programming, amplified with a MATV amplifier and then connected to a quality UHF-TV receiving antenna (used for transmitting) would allow viewers with standard UHF tuning TV sets to receive the broadcasts without specialised (as in 2.4 GHz) receiving equipment. Some tips here - Laceys.tv (info@laceys.tv) carries a line of high output amplifiers. The ALCAD FC-711 has 47 dB of gain with 120 dBuV output capability. A standard VCR UHF modulator with 75 dBuV output will drive this amplifier to 122 dBuV which in turn would connect to a quality UHF TV receiving antenna (say with 10 dB of gain) using 75 ohm RG6 cable would produce 132 dBuV "radiated" signal - 1/4 watt. Distances? With a similar 10 dB gain antenna at the receiver, 4-8 km; more with a masthead amp at the receive site. Details? See SF#105 (May 2003) for diagrams and tips. Technical help? Peter Lacey at Laceys.tv. *2.4 GHz?* Breakthrough, p. 18.

And it tracks the orbit belt!

Adding Ku to existing C-band dishes for increased utility

Recently I have been able to add Ku band reception to C band 2.3 metre prime focus mesh tracking dish using separate Ku-LNB (universal, prime focus type) attached outside and next to C band feeder. The quality of C band reception is not affected at all. Ku reception is surprisingly good. By driving the motor up and down I'm able to pick up Ku signals from Intelsat-180E, PAS 2 and 8, Optus B1, B3, C1, MeaSat2, AsiaSat 3S, and recently NSS6-95E. Ku signal levels are virtually the same as using a standard offset (stationary) 65-80cm dish. The fact that I was able to pick up all Ku satellites from 180E to 95E gives me confidence that Ku tracking works successfully all the way across the Clarke orbit.

To achieve successful tracking the add-on Ku LNB + feed must be precisely positioned with reference to the dish tracking "centre." There are two spots opposite to each other on the outside of the AB diameter of the C band feeder where the dish direction of travel is exactly in parallel with (and is projection of) this part of the Clarke orbit to which our tracking prime focus dish is pointed. If the dish is moved to any other part of the Clarke orbit, the projection is going to lay again in the same AB diameter. When the Ku-LNB is attached in one of these spots it is locked up into Clarke orbit. If the Ku-LNB is not attached to one of these two spots, the tracking reception is not possible and generally the Ku-LNB is pointed outside the Clarke orbit.

When driving the motor, the peak signals for C and Ku band from the same satellite are separated by approximately 4-5 degrees, simply because the Ku-LNB is situated outside of the prime focus.

- In the diagram (lower left) the diameter AB shows the direction of moving East-West for the tracking dish.
- Diameter AB is projection of (parallel to) the part of the Clarke orbit the C band dish is pointing to at present.
- Moving East-West: Ku LNB 1 and 2 move precisely into the "footsteps" of the (centre mounted) C band LNB + feed.
- Therefore, Ku LNB 1 and 2 are locked into Clarke orbit.
- However, Ku LNB 3 is locked out (under) Clarke orbit.
- And, Ku LNB 4 is locked out (above) Clarke orbit.
- Note - All LNBs point to centre of the dish!

C-band feeder installed on tracking dish pointed (in this example) to 25 degrees above the horizon to the north-west. See text for explanation of how Ku LNB locations 1, 2, 3 and 4 function.

At this point we assume you have a 2.3 meter prime focus-tracking dish with C band LNB installed in main focus and the tracking system precisely tuned up (do not touch the tracking tune up in order to improve KU reception!). Installing the new Ku-LNB will take approximately one hour, providing you have the right materials on hand. The cost of the materials will be less then $100. If installation is assembled in the way described below, you will have successful results. Your satellite dish will perform in a superior condition, giving you Ku band tracking reception in addition to C band. You're going to have more positions memorised on your positioner (on my positioner there are 20 positions, 12 C band and 8 Ku band).

Proper tune up of Ku-LNB is needed in order to achieve the Ku tracking and to pick up maximum signals:

- Line up the bottoms of C and Ku feeders in order to save the access of the two, to the reflected signals from the dish.
- Move the Ku-LNB along the periphery of C band feed (15-20mm in one or the other direction - trying to fit the LNB directly onto the projection line of the Clarke orbit).

Report prepared by Bojan Tonev, Brisbane (nikolinatoneva@hotmail.com). The author has completed a number of C-band retrofits using this procedure and will assist you in doing yours!

- Point Ku-LNB towards the center of the dish and a little bit beyond the centre, where the projection of the Clarke orbit lies on the panels of the dish.
- The polarisation is a bit tricky, but there is plenty of signal, so it is not a big deal to find a compromised position. However, if some very weak or different skew polarisation signal is of interest to you, then a second Ku-LNB 2 can be specially installed for this signal (install it on the projection line, diametrically opposite from Ku-LNB 1).

Memorising the position on your positioner: Catching the signal on the prime focus dish main focus means we are not dealing with the main lobe of the dish (we are focusing on side lobes, that's why some signals could be picked up in 2 or 3 different nearby positions). However, the strongest signal should be memorised on the positioner.

Installation assembly

There are two types of mesh dish in regard to the position on the arms supporting the LNB feeder. To find out which type is your dish:

- Drive the motor until the dish reaches highest elevation (true north).
- Face the front of the dish and see what is the configuration of the arms.
- Mark at least one arm with the number corresponding to the drawings, in order to prevent confusion later when you are going to drive the dish down, west, as much as possible to be able to reach and work on the feeder.

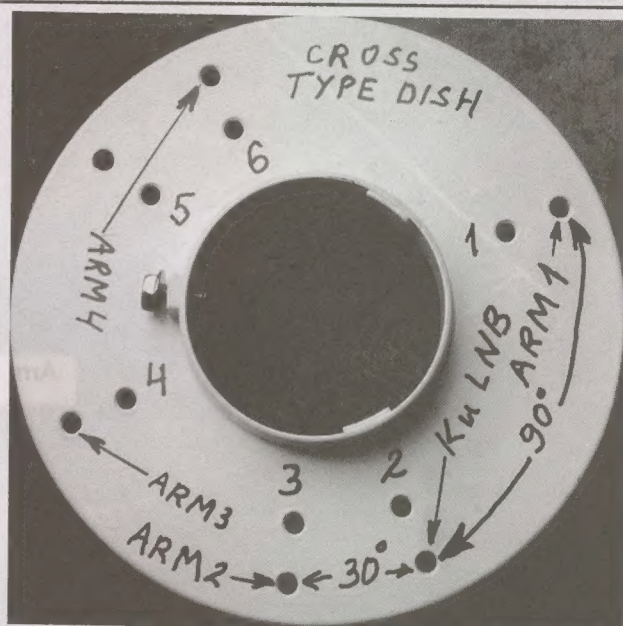
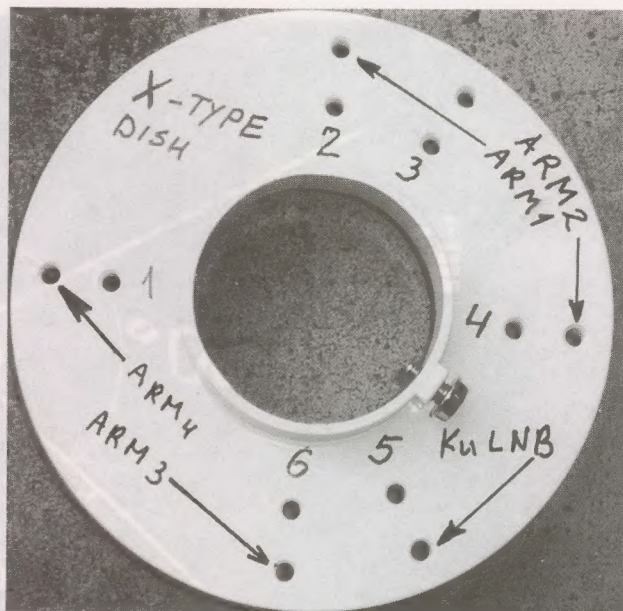
If the dish is X type:

- Drive the dish down, west, as much as possible and if there is a need turn C band feeder clock/anti-clock wise to achieve the assembling of the feeder with the arms in the way shown on the picture.
- Connect Ku-LNB to hole 5.
- Now you are ready to start the tune up of Ku-LNB as mentioned earlier.

If the dish is Cross typed:

- Drill a hole into the periphery of the dish at 1/3 of distance from arm 2 to arm 3.
- Disassemble the arms from the feeder and then assemble in the way that it's marked on the picture.
- Arm 2 connects to hole 3 on the feeder side and the new hole you just have drilled, on the periphery of the dish.
- Support Ku-LNB to hole 2 on feeder.

X-TYPE DISH
2
3
ARM2
ARM1
1
4
ARM4
ARM3
6
5
Ku LNB

CROSS TYPE DISH
6
5
ARM4
1
ARM1
Ku LNB
90°
4
3
2
ARM3
ARM2
30°

Now you are ready to start the tune up of Ku-LNB as mentioned earlier.

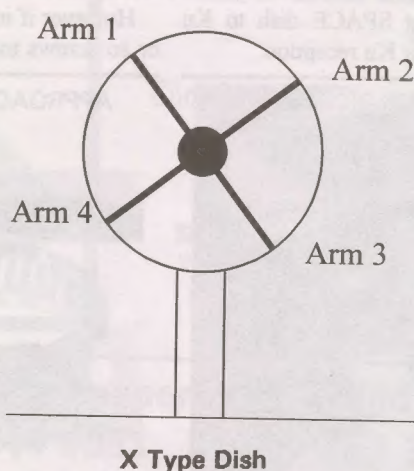
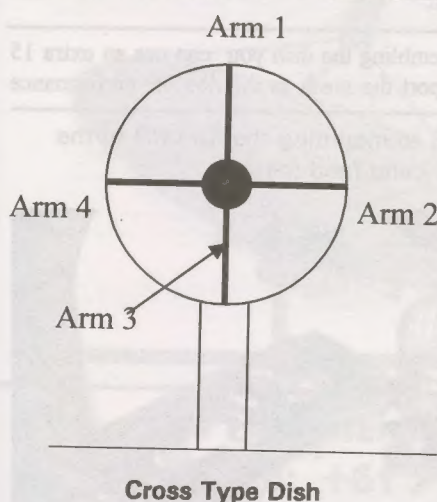
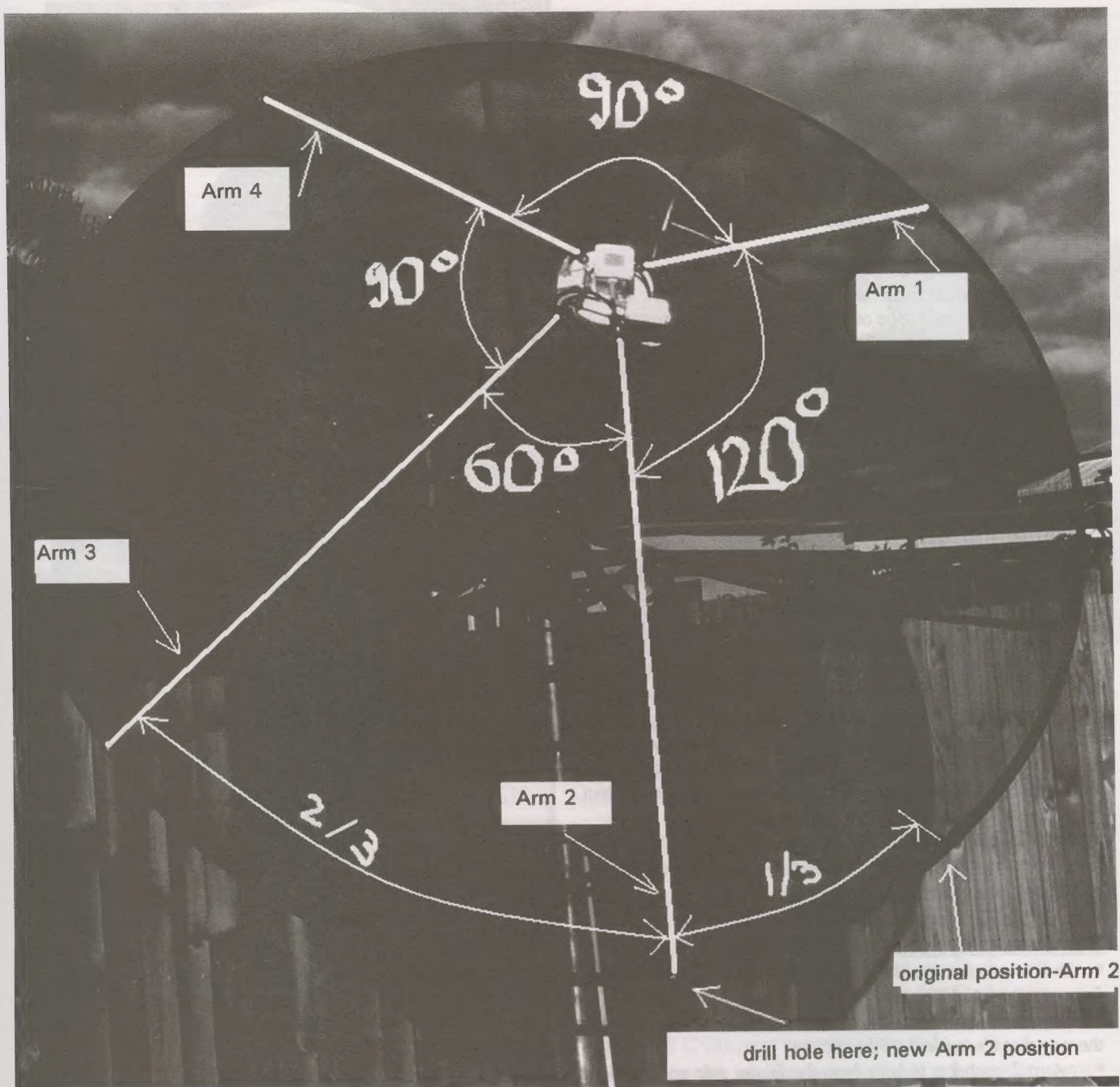
The steps to take

SPACE is a cross type dish. One model is light duty, very easy to work with and does a good job. In Australia, I believe 80% of the dishes previously sold are from SPACE. Up until recently, the mesh did not cover the centre of the dish. A decorative PVC plate with a diameter of approximately 180mm, covered the centre. Upgrading this dish to Ku tracking is not a big deal, however replacing the plastic cover with a metal one is helpful to gain and performance.

More recently the SPACE dish is produced with mesh that leaves only a 80-90mm hole in the centre of the dish and it comes with a metal plate cover

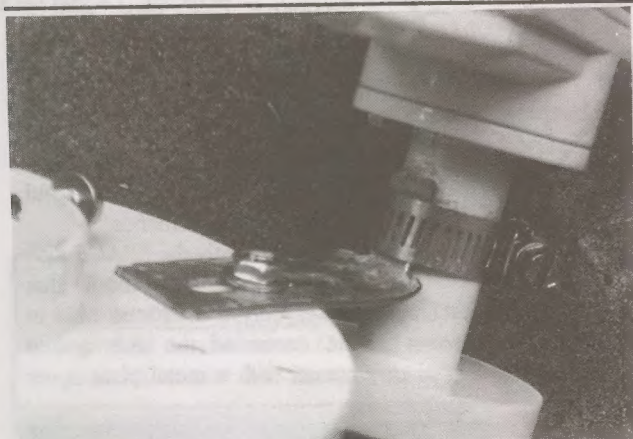
Arm 1
Arm 4
Arm 2
Arm 3

Cross Type Dish

Arm 1
Arm 2
Arm 4
Arm 3

X Type Dish

CROSS type dish after installation assembly, pointing at AsiaSat 2, 25 degrees above horizon, north-west.

for this hole. Upgrading of the latest SPACE dish to Ku tracking, I believe, gives better results for Ku reception.

However if in assembling the dish you can use an extra 15 or so screws to support the mesh to the ribs, its performance

APPROACHES to mounting the Ku-LNB to the C-band feed (detail).

will increase additionally (thereby forcing the mesh to better grip the support struts which is extra important at Ku).

The Joysat, an "X" type design dish, is excellent for C/Ku tracking. There is a metal plate in the centre of the dish ensuring the prime-focus spot provides signal reflection. The mesh is supported very securely and neatly accurately following the shape of the ribs. This is what lifts the performance of the dish in C and Ku band. Joysat is also a source to deliver Ku LNBs, DiSEqC switches and attachments for the installations described here.

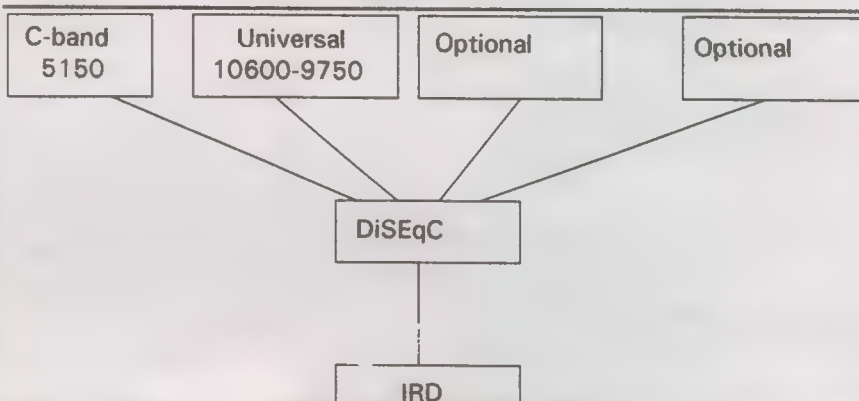
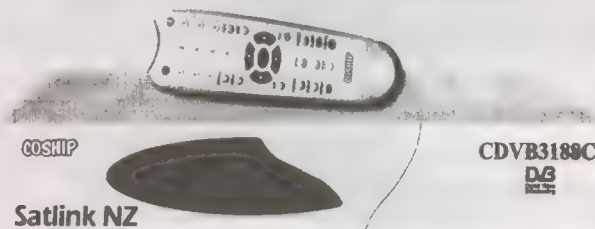
In support of this SatFACTS report, Joysat has available a "Dreamtracking" CD ROM. It contains the material published here plus 35 digital photos of completed installations during last 18 months. The photos are a great help, giving a precise idea of distances and angles used in installations.

Connecting the new universal Ku-LNB to the receiver

The most elegant way is the use of DiSEqC switch but unfortunately it may be a bit of a problem.

The topic has been reviewed recently (SatFACTS, Dec 2002, p 22). If after reading this SF report you are not able to achieve the desired results, the problem likely is not in the DiSEqC switch or Universal Ku LNB, rather, I believe the problem is that the receiver does not send proper DiSEqC/22kHz commands. Receivers that I have that work without any problems are Strong, Nokia or any new box produced in China since January 2003 and available (at least five different names) at Joysat (tel 61 7 3255 5211) and Pacific Satellite (tel 71 7 3344 3883). It makes me believe that people in China do read SatFACTS carefully and immediately take action to correct whatever is possible.

From the older generation receivers Comstar digital with positioner works very well (but not Comstar digital only, which is the same receiver Garry Cratt gave the name R3100 when he sat down and wrote the user manual; SF May 2002 p18). This box actually came initially from Taiwan and later from China with a very good English language manual as many photos showing different stages of the manual supported the writing.

If your receiver cannot do the switching described above, there are other options shown in SF, December 2002, p22. However then you need to use a second Ku LNB supported on the C-band feeder diametrically opposite to the first Ku LNB. If you have HUMAX 5400 or Comstar digital only or any receiver that has 12v switching and if you are lucky to find a spare pair in the cable for the motor, then this pair can be used for the 12v switch.

High speed Internet anyplace in the Pacific!

Steffen Holzt of Pacific IP Services explains remote site accessing

Have you ever wondered what all the "other" carriers are doing on the various PAC RIM satellite transponders? For example, PanAmSat transponder 5C, 27 Mbit/s of Internet traffic directly from the U.S. backbone to Telcos and Internet Service Provides (ISPs) in the Pac Rim region. Or, transponder 10C, a 54 MHz transponder filled with SCPC Internet and data links to and from the various Pacific region island nations. New Skies' NSS-5 has a 64 mbit/s IP carrier while Intelsat has an IP trunking service on several birds. Presently, IP represents anything from 20 to 45% of a satellite operator's business which makes it worthy of closer examination here in SatFACTS.

The Internet is a rapidly growing business; the bandwidth consumed approximately doubles each year. Let's compare this to pay-TV. Consider how big the channel list might be if a pay-TV provider doubled his offering each year for the past five years. More recently, one destination's Pacific bound Internet traffic rose from 6.5 Mbit/s in mid-March 2003 to 10.2 Mbit/s today; an 80% increase in 5.5 months. Foxtel by the same growth curve would today have more than 1,000 channels!

What is driving this spectacular Internet growth? A pay-TV operator once remarked to me, "*Pay -TV sees Internet as competition because when the consumer is using Internet, you receive the information/distraction you desire at exactly the point in time you desire. The user chooses what and when. However, pay-TV delivers a stream of information to you hoping that you are in the mood to consume/watch at least 1 channel out of the offering and thereby believe you are getting your money's worth.*" Pay-TV operators offer for precisely that reason more and more multimedia applications.

Steffen Holzt, a pioneer in the introduction of satellite TV services in New Caledonia, created a business unit which continues to grow ten years later. Likewise, he has pioneered the delivery of Internet to Pacific region customers using specialised equipment and services. This report focuses on that growth (s.holzt@pacificip.com), outlining how even your remote location can join the "Internet Generation."

Most of us have an e-mail address, we all have favourite websites to keep ourselves up-to-date with the latest information on our chosen business; satellite TV. Possibly we go to www.lyngsat.com to update the latest transponder users or to www.apsattv.com for an overview of current user attitudes. Most have installed peer to peer software such as www.kazaa.com, enabling you to share software, music videos, full length movies yet to be released on DVD. All of these applications are bandwidth hungry, a simple music audio clip is 5 m/bytes of data while a full length movie might be in excess of 700 m/bytes of data in VCD quality. So it is not only the quantity of subscribers which increases steadily but that each new subscriber drives incrementally the applications requiring more and more bandwidth.

I recall the time (not that long ago!) that Internet began in New Caledonia; a company with a great deal of entrepreneurial skills dared to order a 64 kbit/s link. The average client's transfer rate was a mind boggling 50 to 300 bytes per second, almost all websites timed out (shut down) before you could load the content you were after, and downloading a file larger than 50 kbyte/s was a major risk taking as more often than not you would be disconnected well prior to finishing the download.

Today, barely 5 years later, the majority of clients have ADSL and transfer rates below 30 kbyte/s are considered sluggish. The total New Caledonia Internet capacity has grown from 64 kbit/s to 44mbit/s in only 5 years! Now this is serious growth, 680 times, in 5 years and any banker with money to lend would gladly participate in a loan for a business case that could be shown to grow 680 times in 5 years.

In Australia and New Zealand, most of the Internet traffic is over (undersea) fibre (cable) from and to the U.S. as well as Asia. The Southern Cross Cable travels from the U.S. via Fiji to Auckland (and then Sydney) with a capacity in excess of 140 Gbit/s. But having fibre into and out of a country does not

31-Aug 2003 à 16:23

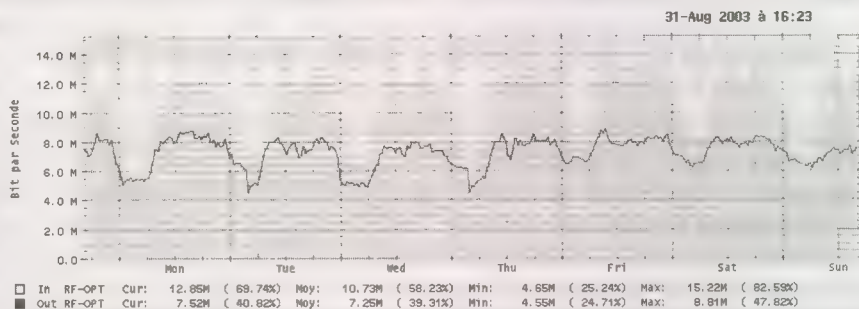
Bit par Seconde

10.0 M
8.0 M
6.0 M
4.0 M
2.0 M
0.0

Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug

□	In	RF-OPT	Cur:	11.17M	(60.60%)	Moy:	8.79M	(47.70%)	Min:	5.07M	(27.50%)	Max: 11.88M (64.47%)
■	Out	RF-OPT	Cur:	7.56M	(41.03%)	Moy:	5.78M	(31.35%)	Min:	3.58M	(19.40%)	Max: 7.72M (41.90%)

Television via satellite-Internet?

Recent developments in the compression of television algorithms ("Coop's Comment," p. 1) opens up for perhaps the first time the ability to deliver one or a wide selection of "distant television channels" to isolated locations. While few (if indeed any) commercial pay-TV channels would "settle for" for the "bandwidth" equal of 256 kbps, when you have no TV, it looks pretty good (VHS quality, in fact). The "Beta testing" we reveal on p. 1 includes USA "gateway/launch sites" with London, Moscow and Tokyo scheduled by year's end. This is not broadcasting; it is one launch server to one distant receiver. And it works with Intelsat, PanAmSat and other satellite delivery systems (as well as fibre). With satellite delivery costs coming down, this format of TV delivery (including the user's selection of which channel he wishes, when, from a distant point) could be a significant new tool. *Stay tuned;* TV is changing!.

guarantee a solution to what is known as the "last mile problem." The content, plus what the user originates, still has to be delivered in a reliable way. Think of it this way: An airmail letter travels from Los Angeles to Auckland or Sydney at 600 miles per hour in a jet. But for that "last mile" it is delivered on foot (or a bicycle) at less than a mile per hour. Fiji is an example of the imperfection of the present system. Fiji has a U.S. $30 million Southern Cross landing into Suva. But once there, the existing telephone plant slows down the "last mile" (or miles in this case) delivery speed to around 2 to 3 kilobytes per second; ADSL or other higher speed subscribers do not exist because the infrastructure is not in place. At the same time, lacking even the "promise" of fibre landing on your shores, the only remaining choice is satellite - the position of virtually the entire balance of the Pacific.

How it works

There are a number of technical options of which the most frequently deployed is SCPC duplex links from and to the U.S. west coast through a local Telecom operator (on an island) who then passes the link on to one or more local ISPs. It is the ISP's responsibility to redistribute the contents via a dial-up, ADSL, WiFi/WLAN (2.4 GHz or other low power, low in cost duplex microwave) or locally leased lines. The design goal of these satellite links is 99.98% reliability, 100% committed information rates, no bottlenecks, no slow performance hours, no downtimes (setting aside the inevitable few hours per year cumulative "solar outage" events surrounding each equinox period). These links are invoiced at rates exceeding US$6,000/mbit per month simplex. The equipment used is sophisticated, hot redundant satellite modems (US$14,000 to $35,000) with high speed serial interfaces connected to the client's routers. Performance is closely monitored and graphs of throughput are available on-line (above).

Then there are something called DVB-IP links. All operators have DVB-IP platforms on their satellites. IP packets are encapsulated in a DVB protocol, the receiving station is given a PID which carries their IP traffic, stipulates the data rate and bursting capabilities. Because of the use of DVB technology, the receive site potentially can be quite inexpensive with receivers ranging from US$100 to $2,000 while their interface to "the network" is standard "ethernet." Additionally, by using DVB technology, you can multiplex several clients into one data stream resulting in more efficient use of bandwidth. But, DVB does not allow for "frame relaying" (virtual circuits within your own link) which makes the client rely on the uplink provider for changes in (system) configuration.

As an example, assume a normal dial-up client which connects to Internet via his personal modem where the speed rarely exceeds 3.5 to 4 kbytes/s. Why? His 56 kbps modem rarely supports greater speeds through his local copper wire "last mile" bottleneck. For a step into the world-via-satellite, an IPricot DVB receiver (below), which has the physical appearance of a cigar box, magically transforming the satellite signal to an ethernet port.

On page 14, top left, a "screen shot" which most satellite folks will instantly identify with; PanAmSat-2 carrier parameters. All LNB (as shown on screen) and tuner settings are pretty standard, adding only the PID which defines our Internet-via- satellite service. The connection is simplistic and quick but first we need to do some network designing.

IPricot satellite receiver has unique shape!

The (satellite) operator will require the MAC address of the DVB-IP receiver. With this address the traffic is directed to this specific receiver, and the service is authorised or deauthorised at will by the "Gateway" operator through the satellite uplink station. There are now two configuration options: (1) the user "owns" the IP address or, (2) a small group of IP addresses is attributed by the service provider for this circuit. The address base is "advertised" (passed on, shared) over the Internet by the Gateway at the uplink. This means that within a couple of hours every router connected to Internet "knows" that somebody coming from this IP address wishes his data to go to this specific Gateway-Teleport where all traffic will be redirected over the satellite straight to the origin of the IP address. In our example here, we attributed /29 as an address to the client, which means he has 6 public IP addresses to "play" with (and use).

At this point 1 IP "address" is attributed to our customer's computer, the other to the receiver and we can "talk" to it via the HTML interface and enter the basic tuning parameters most readers will identify with. Note the PID which defines the client's service and subsequently his/her data rate.

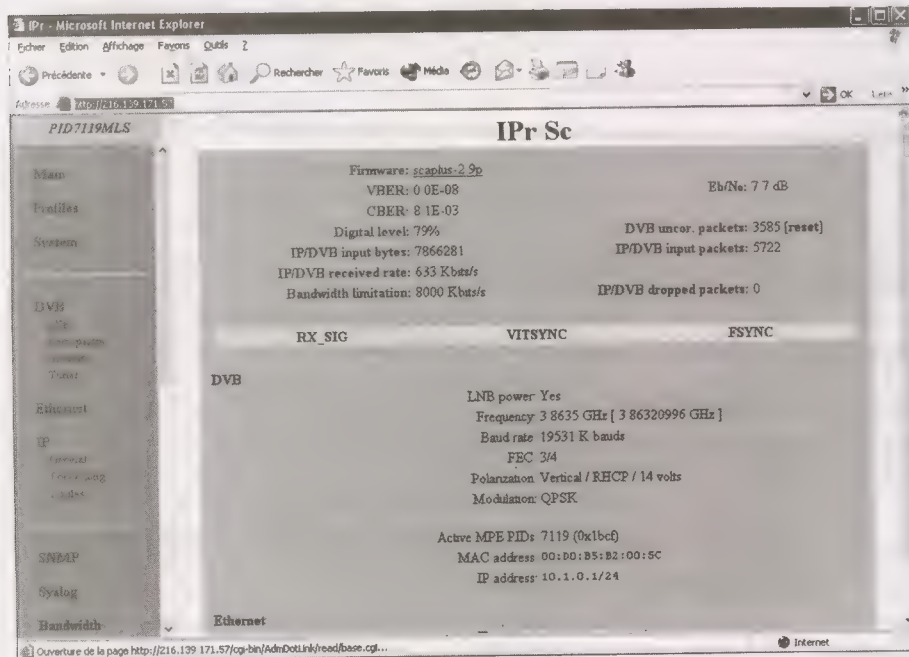
The next step is to create a "default route" for the receiver to route all packets to the return channel gateway. This could be a dial-up modem, an ADSL modem or any other means of transporting the packets back to Internet. And this raises a vital issue - address translation. Once you connect via your dial-up modem and you type the command IPCONFIG in your DOS screen, you will see the IP address your ISP has

attributed to your modem. Each time you make a request to Internet, this IP address is published which defines the "way back" to your computer. But in our situation, we do not want to return via the ISP's path; rather, we want to go via satellite. Therefore in addition to the DVB-IP receiver, we are setting up the NATTING or network address translation. Once this is established, your ISP still gives his IP address but all requests you send to Internet are done with the satellite provider's IP address and since the Internet "knows" that all packets with this particular address should go via satellite, that completes the instructions. It all comes back via the bird straight into your receiver and then your computer. Using this hybrid service (hybrid means download via satellite, upload via local telephone line, leased line or ADSL), your download speed is limited by the size of your wallet and needs - so to speak!

Looking at your dial-up modem's LED, you will notice that only the TD (transmit data) LED flickers; the receive data never does. Which means your modem only transmits; all incoming packets are coming back through the satellite. Tests have borne out that even with a GSM telephone device used as your outbound, limited to GSM's 9.6 kbps outbound speed, inbound speeds up to (your wallet talking, here!) of more than 1.2 mbit/s can be realised. In this case, "the last mile" walks going *out* while coming *in*, it "flies." Speeds over satellite?

Latency is the one major problem with satellite. It takes 270 milliseconds for the gateway launched data stream to reach the satellite, pass through, and arrive at the receiving station. If your system uses satellite in both directions, that is 270 milliseconds x 2 (540 milliseconds) round trip. The Internet TCP/IP protocol requires packets to be acknowledged before a new packet is sent by the distant router, called "packets in flight." Obviously the longer the total route mileage, the fewer packets that can be "in flight" since the system does not like to find "too many packets in flight" and unacknowledged. The router responds by saying "STOP - let us see if everything has arrived before I send more!" By fine tuning the window size of packets allowed in flight (MTU - maximum transfer units - in flight at any point in time), the system can achieve single session transfer rates of up to 110 kbyte/s or approximately 1 Mbit/s. The screen shot appearing at the top of page 15 shows a standard download of a software package received from a Swedish server, which by mileage is a "round the world trip" from my location in New Caledonia. My Windows Operating System is in French so you are language-challenged here!

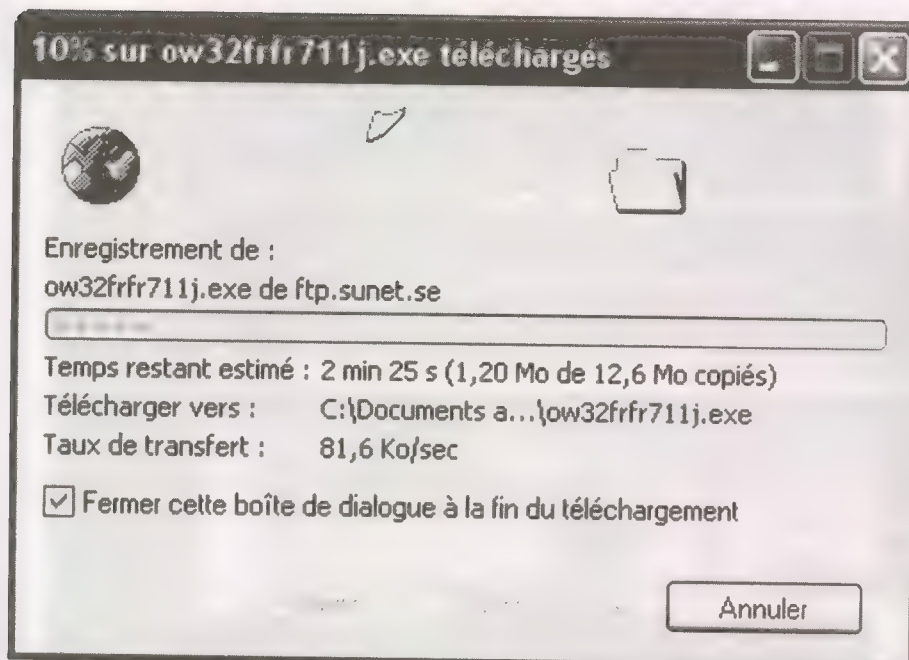
The translation reveals the actual transfer rate is 81.6 kbyte/s and the computer estimated that it will take 2 minutes and 25 seconds to download a full file of 12.6 megabytes. Remember, this is a single session; if you open several downloads at the same time, you realise the same speed simultaneously on the second download, as long as "the pipe" is not yet saturated.

Once finished (above) the result was 12.6 megabytes downloaded in 2 minutes and 42 seconds. Be honest - can anyone beat (or equal) that in the Pacific? Very unlikely! For comparison, consider that a reasonable pay-TV digital video quality operating at 3500 kbit/s, 640 kbit/s does not sound like very much. But it allows for full screen TV pictures which are very "watchable." Other protocols allow much higher single session data rates over satellite and by simply not requiring packet acknowledgements, the computer downloading the data informs the distant router if something was not received causing the distant router to resend the packet/package. These "push" applications allow for digital video quality streams to be sent via satellite Internet. Pay-TV providers, in lieu of mailing

10% sur ow32frfr711j.exe téléchargés

Enregistrement de :
ow32frfr711j.exe de ftp.sunet.se

Temps restant estimé : 2 min 25 s (1,20 Mo de 12,6 Mo copiés)
Télécharger vers : C:\Documents a...\ow32frfr711j.exe
Taux de transfert : 81,6 Ko/sec

☑ Fermer cette boîte de dialogue à la fin du téléchargement

Annuler

video cassettes or renting (full programme bandwidth) feeds on satellite, simply send the programming in a "huge" e-mail to the uplinker containing 5 to 8 gigabytes per 1 hour program. If the "pipe" (from gateway uplinker to you) is "big enough (4 to 5 mbit/s), the entire programme can be event sent in "real time."

Téléchargement terminé

Téléchargement terminé

Enregistré :
ow32frfr711j.exe de ftp.sunet.se

Téléchargé : 12,6 Mo en 2 min 42 s
Télécharger vers : C:\Documents a...\ow32frfr711j.exe
Taux de transfert : 80,1 Ko/sec

☐ Fermer cette boîte de dialogue à la fin du téléchargement

Ouvrir | Ouvrir le dossier | Fermer

Getting this service

There are many providers who offer these services, and the most important "small print" contractual term is something called CIR; Committed Information Rate.

If you wish to purchase a CIR of 1024 kbit/s, this translates to approximately 800 kHz of bandwidth on satellite using a QPSK of (FEC) 3/4. This means the satellite provider, to guarantee 24/7 1024 kbit/s, has to set aside 800 kHz for your pathway and that in turn means you have to pay for the exclusive right to the 800 kHz. This works out to 4.5% of a total (typical) transponder. Satellite operations, in an ideal "real world," where if the transponder sells for U.S. $1.5 million per year, this works out to U.S. $67,000 per year. Monthly? U.S. $5,600 per month (for 1 megabit bandwidth) for the space segment. Add to this charge the uplink charges at the gateway and the backbone connection to the TIER 1 providers in the U.S., and you have a net cost of at least U.S. $7,000 per month (1 m/bit). Prices below this reference example means your operator has "good" transponder pricing, or, the modulation used allows for more mbit/s per MHz.

Other options? Non-CIR allows a sharing of your bandwidth. Typically, if you elect non-CIR, your bandwidth will be "shared" with other users which means "first on - first to use" situations. Most professional users faced with this option elect to stay with CIR because it means their bandwidth is theirs - alone- and they never have to "wait" until a sharing user is done. Pacific IP Services, as an example, sells only CIR level service.

Equipment used

Simplex links require only a simple receive-only dish, typically 2.4 to 3.6m in the Pacific. A standard LNB and a DVB-IP receiver is also required. Several manufacturers offer suitable products and PacificIP has recently completed testing on Broadlogic, IPricot and VBOX. The total budget starts at around AUD $1,000, to AUD $5,500 depending on the receiver chosen. Duplex (incoming satellite, outgoing satellite) requires professional satellite modems, transmit capable (approved by the satellite operator) dishes with outdoor RF amplifiers (the transmitter portion amplifier mounts right at the dish feed). How much? AUD $25,000 and if your location demands a 3.6m down/uplink dish, up to AUD $45,000 for simple but efficient ISP systems capable of serving the needs of an entire remote island.

Of course this level of funding is not within the reach of individual remote homes except under the most demanding (and well funded) of circumstances. There are other options. For example, "Hub Systems" create attributed "time slots" allowing the sharing of frequency/uplinks thereby saving on the cost of the satellite space segment. Unfortunately, when you elect to "share" there are new electronic equipment demands which raises the base cost. In the Pacific, this is a new concept and only time will tell how it works out.

Satellite Internet: The Future

Anyone and everyone capable of accurately seeing the future - please step forward and you will *immediately* have a job with our company! What one can say for sure is that bandwidth demands will continue to increase and I believe double each

year for at least the next few years. Applications still to be invented and applied to satellite are yet to be trotted out for commercial use. Equipment prices are certain to come down as new technology matures, while new modulation techniques and frequencies will gradually reduce the size of dishes and the associated costs.

Getting the service

Pacific IP Services are available from Samoa to Singapore, Japan to New Zealand. Your physical location will determine the most suitable satellite platform for your needs.

Trial runs

PacificIP arranges free trials under condition that the customer provides his/her own equipment. Trials can last days, weeks, months depending upon the size of the potential business and the complexity of the proposed system.

Acknowledgement: To PanAmSat Corporation which has been very helpful in enabling our firm to develop our business in the Pacific Rim region. E-mail: sales@pacificip.com.

Your opinion? Let us hear from you at SatFACTS (skyking@clear.net.nz).

A major breakthrough in receiving systems!

Chinese Manufacturer Will Now Supply S-band (2.4/2.483 GHz) LNBs for Terrestrial Links

Job done. After 90 days of search, SatFACTS and Peter Merrett of Sciteq P/L have located a reliable, high quality source for S-band LNBs. The Chinese manufacturer was spotted by Peter while he was attending the IFA show in Berlin during early September. Within seven working days, SatFACTS had two samples of the new *custom-designed* device *in our hands* via Fed-X; pretty amazing!

SatFACTS tests and development has shown (SF#108) that by replacing the cheaply built and poorly designed 2.4 - 2.484 GHz surveillance-grade receivers with a suitable masthead amplifier + frequency conversion to L-band, system designers are now able to utilise readily available L-band analogue receivers for reception of 2.4 GHz video (+ audio) transmissions. In the best case we found the "stock" receivers from Merit, All Things and others might recover usable transmissions over distances to 3 km. But when we threw away the surveillance receivers and replaced with an S-band LNB feeding into L-band (TVRO) receivers the very same transmitter was clean and clear at distances of 20 km. This is not merely about distance. Many high density buildings (steel and reinforced concrete construction) present significant barriers to reception even at distances as close as a few hundred metres. The S-band LNB connected to a variety of low-cost, readily available L-band analogue receivers changes all of the rules

Those interested in dealing directly with the Chinese manufacturer (they offer 2.3 - 2.7 with LO at 3.650; 2.5 - 2.9, LO at 3.850; 2.3 - 2.9, LO at 3.950) should contact SatFACTS (email skyking@clear.net.nz; tel +64 9 406 0651). The prototype model for our evaluation (above) had one correctable mistake - a female type N connector rather than our requested male N (thus explaining the heavy-line link in the photo). But it worked as good (or better than) the original Gardiner unit and in small quantities is very reasonably priced (in region of A$50).

NEW Chinese designed "S-band" LNB provides 2.4 GHz to L-band conversion, gain, low noise front end; good bye junk surveillance receivers!

Next? The antennas. Those available "work" after a fashion but better ones are under development. Perhaps the least complex antenna for most applications is a 60-80-90cm dish. Unfortunately, there is a missing element - the "feed" antenna to mount at the focus point. And a transmit antenna system may require a totally different "feed antenna" configuration to a receive antenna. 2.4 GHz will never be the same again and we'll have progress reports!

N-female

N-male

S-band LNB

Merit (or other) S-band directional gain "Yagi" / "yaki" antenna for receive

Chinese S-band LNB connects simply by screwing male "N" fitting attached onto antenna mounted female "N" fitting

S-band LNB provides gain, low noise figure/temp amplifier and frequency conversion to "L" band

TECHNICAL TOPIX

The Humax 5400 power supply

Importer Sciteq has *not found* the failure rate of 5400 series (including 5410) IRD power supplies to be "beyond the expectations of 1%." But some users report much higher rates, especially for receivers used in 24/7 applications. The first supposition, incorrect as it turns out, was that in commercial 24/7 installations receivers had been carelessly placed and heat was the culprit. This does not appear to be the case; SatFACTS found the high rates run across a wide variety of installations with no clear IRD heat condition indicated. A second assumption, also found wanting, was that the receivers might have been closely bunched together in time of purchase and a "failure prone" group of power supplies just happened to be involved. Also not true - the serial numbers, verified by the importer, cut across many months of Humax production.

Humax, like most IRD suppliers, purchases power supply boards from one or more subcontractor firms although there is a common design (created and perfected by firm Kampftrinker). Merrett advises, "it is difficult to determine whether a particular power supply module came from a specific run of SMPS boards. However, you can get a rough date of IRD production from the serial number by noting the first 3 digits in the unit serial number: It is a ymm format; 101 indicates 2001 January. Later versions changed to a 11TO prefix followed by the ymm notation."

Garry Cratt (Av-comm Pty Ltd), largely supplying commercial customers with typical 24/7 applications, at SatFACTS request took the lead in diagnosing and correcting the faults. After detecting an unusually high number of requests for "emergency replacement boards" from customers, Cratt contacted SatFACTS for our reader experience. Coincidentally, we too had begun to hear from those experiencing problems - typically 12 to 14 months following the IRD installation (yes - just *beyond* the one year warranty period although we assume that is a coincidence, not a built-in self-destruct factor!).

Replacement SMPS boards are available directly from importer Sciteq (A$32 + GST to dealers, A$38 + GST to website retail buyers; www.sciteq.com.au).

Replacement

The instruction for replacing a defective board is very straight-forward. Five screws holding the Humax upper body cover are removed revealing a receiver interior which when viewed from the rear deck has a stand-alone power supply board on the right. There are four self tapping bronze coloured screws holding the board in place, a pair of rear-deck to board powering cables and a 12 pin/socket cable connecting the power supply board to the receiver board. Remove the four screws, pry/lift up the two power related cords (note: pay attention which one goes back where - the sockets are adjacent and these should not be mixed up!) and using a small bladed screwdriver or pocket knife gently force the 12 pin powering cable loose from the IRD-proper-end (see photo below; board removed from receiver). From start to finish, under ten minutes to replace a defective board.

Repair

In approximately 25 receiver power supply failures monitored by SatFACTS and Cratt, we found a commonalty of

ZD3 - (>1.5w)
C9 (>16V)
R17 - (raise)
R2 - (raise)
R1 - (raise)
C15 (>1000uF)
C19 (>220uF)
R21 - (>0.5w, raise)

failures. Not all receivers had *all* of the same failures but the pattern was none the less very evident. The most common failure (over 90% of cases studied) included capacitor C9 (see photo) which was factory original with a 10V rating. Cratt found 10V is across it full-time ("eventually it dries out and fails; it is intended to smooth out ripple and the peak ripple voltage apparently exceeds the working voltage. Many I have seen actually explode, pushing the bottom seal out with about 50-50 going short or open.") The improved replacement part should be 16V rated (see table, right). C10, which follows the ripple smoothing choke (L2 on schematic; below) is also 10V rated *but* with the ripple gone, no part failures have been reported.

A similar under-rated-part problem apparently exists with ZD3. This 30V zener diode in the factory version is 0.5 watt (500 mW). The high failure rate (over 70% of those studied) urges a higher capacity zener (1.5w is urged).

"There was apparently a post-schematic parts change for R21," notes Cratt, "in later generation 5400/5410Z PSUs. The original was a 100 ohm (decoupling) resistor whereas later PSUs have a single turn (RF) choke here." Both the original 100 ohm and the single turn choke are heat source problems leading to SMPS failure. Cratt suggests R1, R2, R17 and R21 should be desoldered and raised above the PCB 6mm (*original* factory version had parts directly on top of board). "When you see a scorched board under a part, you *know* there is a heat problem" he notes. In this process, R21 goes from 0.3w to 0.5w.

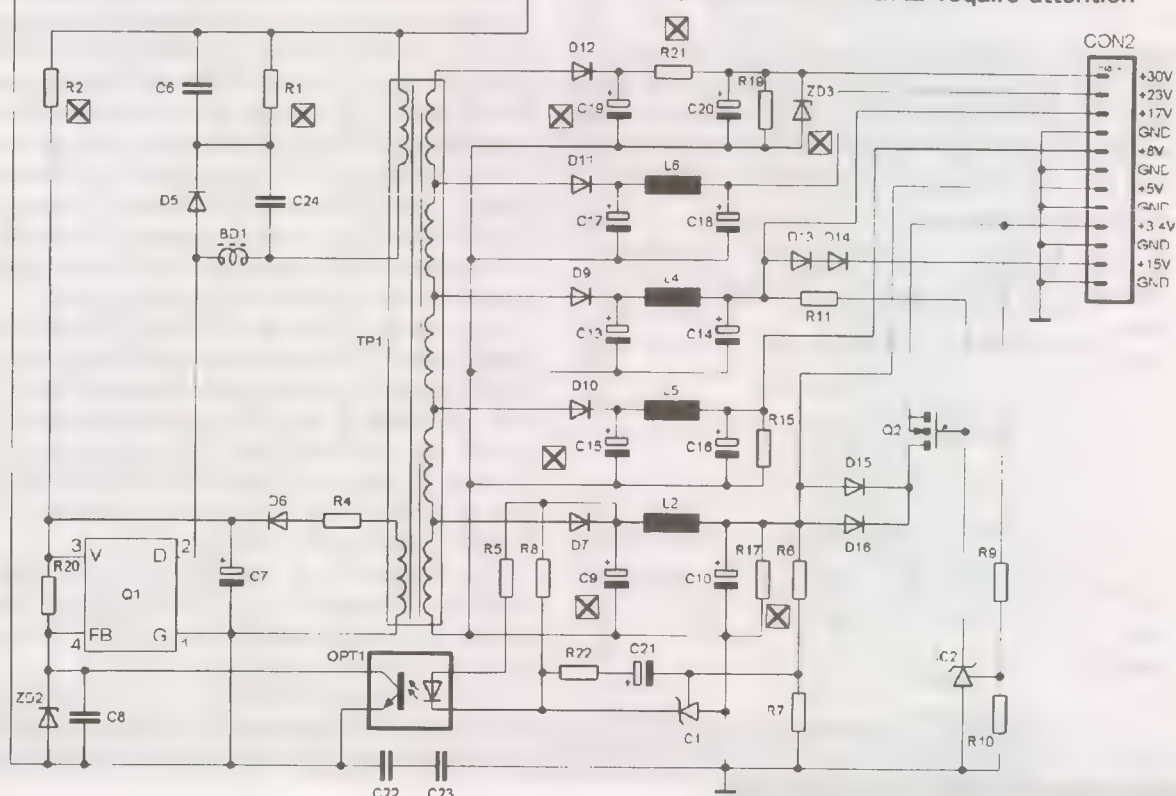
Bottom line? Repairs are straight forward, faulty parts locating should be faster using the information here with the usual cautions about selecting a small wattage fine tip soldering iron when "lifting " R1, 2, 17 and 21 above the PCB. *Original* design faults? Cratt: *"That's what I believe."*

The at-risk parts

C9 - make 1000uF 16V (was 10V)
C15 - make 1000uF 25V (was 500uF)
C19 - make 220uF 50V (was 100uF)
R1 - still 47k ohm, 1 watt; raise above PC board
R2 - still 180k ohm, 1 watt; raise above PC board
R17 - still 56 ohm, 1 watt; raise above PC board
R21 - make 100 ohm, 1/2 watt (was 0.3 watt) and raise above PCB
ZD3 - make 30V, 1.5w (was 30V, 500 mW)
(courtesy Garry Cratt, Av-comm Pty Ltd)

R1 (raise*)
R2 (raise*)
R17 (raise*)
R21 (raise*)
C9 (increase working voltage)
C15 (increase capacitance)
C19 (increase capacitance)
ZD3 (increase wattage)
* - Later version p/s have cut out the board below R1, R2, R17, R21 to reduce board heating (scorching) problems.

parts marked with ☒ require attention

CON1
TNR1
AC 230V~
C1
L1
C2
C4
C5
R3
D3 D4
D2 D1
SW1
F1
TH1
C3
R2
C6
R1
D5
C24
BD1
TP1
D12
R21
C19
R18
ZD3
C20
CON2
+30V
+23V
+17V
GND
+8V
GND
+5V
GND
+3.4V
GND
+15V
GND
D11
L6
C17
C18
D13 D14
D9
L4
C13
C14
R11
D10
L5
C15
C16
R15
Q2
D15
D16
D6
R4
L2
D7
R5
R8
R17
R6
R9
C9
C10
V D
Q1
FB G
R20
C7
OPT1
R22
C21
ZD2
C8
C1
R7
C2
R10
C22
C23

Part	Value	Function	critical
BD1		Choke	
C1	100nF / 250V~		
C2	100nF / 250V~		
C3	82µF / 400V / 85°C		
C4	2.2nF / 250V~		
C5	2.2nF / 250V~		
C6	10nF / 1kV		
C7	33µ / 50V / 85°C		
C8	22nF / 63V		
C9	1000µF / 10V / 105 C		high
C10	1000µF / 10V / 105°C		high
C13	1000µF / 25V / 105°C		yes
C14	1000µF / 25V / 105°C		yes
C15	680µF / 25V / 105°C		yes
C16	470µF / 25V / 105°C		yes
C17	220µF / 50V / 105°C		yes
C18	220µF / 50V / 105°C		yes
C19	100µF / 50V / 85°C		
C20	100µF / 50V / 85 C		
C21	1µF / 50V / 85 C		
C22	3.3nF / 250V~		
C23	3.3nF / 250V~		
C24	100pF / 1kV		
CON1		Connector AC230V~	
CON2		Connector Output	
D1	1N4007		
D2	1N4007		
D3	1N4007		
D4	1N4007		
D5	1N4937		high
D6	1N4937		
D7	YG811S04		
D9	1N C30 02		
D10	UF5[illegible]		
D11	1N C30 02		
D12	1N4937		
D13	1N4007		
D14	1N4007		
D15	1N5402		
D16	1N5402		
F1	T2A	Fuse	
IC1	KA431	Regulator	
IC2	KA431	Regulator	
L1		Choke	
L2		Choke	
L4		Choke	
L5		Choke	
L6		Choke	
OPT1	1KC317	Opto Coupler	
Q1	1L0380R	Switching Regulator	
Q2	IFZR34A		
R1	47kOhm / 1W		
R2	180kOhm / 1W		
R3	680kOhm / 0.3W		
R4	68Ohm / 0.3W		
R5	33Ohm / 0.1W		
R6	1.1kOhm / 0.1W		
R7	1.1kOhm / 0.1W		
R8	2.7kOhm / 0.1W		
R9	1kOhm / 0.1W		
R10	3kOhm / 0.1W		
R11	2.2kOhm / 0.3W		
R15	680Ohm / 0.3W		
R17	56Ohm / 1W		
R19	10kOhm / 0.1W		
R20	1.8MOhm / 0.1W		
R21	100Ohm / 0.3W		yes
R22	1kOhm / 0.1W		
SW1		Connector Switch	
TH1	TP 10D-9		
TNR1	1NR100471		
ZD2	1N5239B (Z-Diode 9.1V / 500mW)		
ZD3	Z-Diode 30V / 500mW		yes

Humax p/s components

LNB LOs

There are a number of confusing elements relating to the choice of appropriate LNB(f) devices for use within Australian and New Zealand Ku-band services. The primary Pacific Region Ku satellite band is 12.25 to 12.75 GHz. Within the satellite reception system, the incoming Ku band signal(s) must be down converted to L-band (950 - 1450/2150 MHz) for processing. The "trick" is to take whatever the incoming Ku band might be and reposition it within the tuning range of the available L-band receivers.

The LO or local oscillator within the LNB(f) does that. The LO is a (very) low power transmitter or signal source and when this LO signal generated within the LNB is connected ("fed") to another LNB stage called a "mixer," a new frequency emerges. The math behind it is very simple: 12.500 GHz from the dish feed is amplified by the LNB, "fed" to the mixer where it "mixes with" the 11.300 GHz LO. Out of the mixer? 12.500 - (minus) 11.300 becomes 1.2 GHz (1,200 MHz). The L-band mixer output signal on 1,200 MHz is the "difference" or remainder when 11,300 is subtracted from 12,500; totally identical content to the original 12.500 GHz input.

LO or local oscillator frequencies are built into the LNB at the time of manufacture. Some LNBs have dual (2) or even quad (4) LOs which are user selectable with appropriate voltage or "tone" signals supplied by the IRD/receiver. Multiple LO LNBs are especially common in Europe where satellite Ku band broadcasting overflows below our lower frequency edge of 12.25 GHz in Australia and New Zealand.

European Ku satellites operate over a range of more than 2,000 MHz (from the lowest Ku frequency near 10.XXX to the highest Ku frequency near 12.750). Obviously with one dish and one LNB feeding one receiver it is quite impossible using any single LO to fit 2,000 MHz of Ku band into 1,200 MHz of L-band. How's that? Modern receivers for L-band cover 950 MHz to 2,150 MHz; a 1,200MHz frequency span. The answer is to offer different LOs to the mixer, each of which creates a *new* L-band from a segment of the original Ku band. The table below illustrates.

LO Freq	Input/ choice "A"	Output/ choice "A"	Input/ choice "B"	Output/ choice "B"
11.3(00)	12.25-12.75	0.950-1.450		
10.75(0)	12.25-12.75	1.500-2.000	11.75-12.25	1.000-1.500
10.7(00)	12.25-12.75	1.550-2.050	11.65-12.25	0.950-1.550
10.6(00)	12.25-12.75	1.650-2.150	11.55-12.05	0.950-1.450
9.75(0)	10.70-11.90	0.950-2.150		
9.70(0)	10.70-11.85	1.000-2.150		

10.6, 9.75 LO combos are called "Universal" LNBs

Some practical examples. If the LNB(f) has two permanently mounted probes, one each for vertical and horizontal, with two LOs (one for 11.3, one for 10.75), switching probes (DiSEqC or other) could connect the vertical probe to the 10.75 LO creating L-band of 1.550-2.050 and horizontal probe to the LO of 11.3 creating L-band of 950-1450. Take it one design step further. Inside the LNBf are two complete LNBs, one full-time connected to the 10.75 (GHz) LO and one full-time to the 11.3. Now if horizontal creates L-band of 950-1450 and vertical creates L-band of 1550-2150, why not combine the two separate LNBs together into a <u>single</u> downline to the receiver?

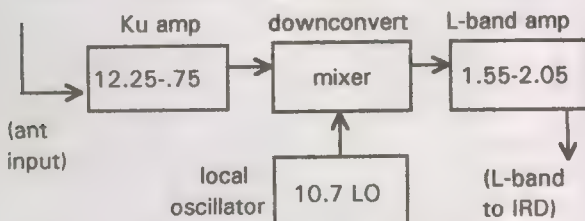
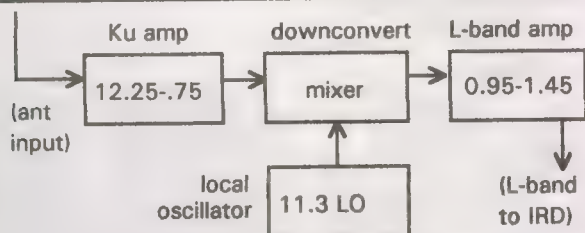
Another step. Add a second (third, etc.) receiver to the system - each will have *totally independent* access to any of the horizontal (950-1450) <u>or</u> vertical (1550-2150) L-band "IF" channels. No probe switching; *full time service* to <u>any</u> transponder from any location. All on one cable.

As many as 8 LNBs have been built into one housing for European use - each covering approximately 500 MHz of spectrum and one polarity each (satellites normally confine their downlinks to 500 MHz bandwidths shared between vertical and horizontal). Still other combinations with say 11.3 and 10.0 (GHz) LOs can create 950-1450 from the 11.3 LO or 1000-2100 from the 10.0 LO, DiSEqC switch or 0/12V switchable at the receiver.

For C-band there is a "one cable solution" product as well; an LO of 5.150 produces 0.950-1.450 for one polarity while a second LO-mixer package using 5.7 (GHz) creates 1.500-2.000 L-band.

All of this says that "standard LNBs" are ancient history; if you shop around, there *is* a LNB solution for your situation.

Ku amp
downconvert
L-band amp
12.25-.75
mixer
0.95-1.45
(ant input)
local oscillator
11.3 LO
(L-band to IRD)

Ku amp
downconvert
L-band amp
12.25-.75
mixer
1.55-2.05
(ant input)
local oscillator
10.7 LO
(L-band to IRD)

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 October 2003

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym	Receivers and Errata
Thcm3/78.5	SkyChAust	3695/1455H	up to 3	3/4	5(.000)	CA (#1, 3); FTA audio #2 (dm)
	Indiavision	3685/1465H	1	3/4	6(.830)	Tests June 2003, not permanent
	MRTV-Myn	3676/1474H	1	2/3	6(.000)	erratic service
	Korean Central	3665/1485H	1	2/3	3(.367)	Global footprint; changes 02/03.
	TARBS ME mux	3640/1510H	12TV, 12 radio	2/3	28(.066)	CA + 2 FTA(A1TV, IRB3)(DM)
	Ch Nepal	3626/1524V	1	3/4	15(.556)	New 03/03; FTA
	Mahar mux	3600/1550H	11TV, 1 rad	3/4	26(.667)	Thai + Indian services; FTA (DM)
	SE asia Mux	3569/1581H	2+ TV	3/4	12(.500)	MRTV3, MRTV (DM)
	RR Sat mux	3551/1600H	8TV,10 radio	3/4	13(.333)	3TV, 5radio currently in use (DM)
	JAIN TV	3538/1612V	1TV	3/4	3(.300)	PIDs 4132/4133
	PTV1 +	3521/1629V	1TV, 1 radio	3/4	3(.333)	frequency change
	TARBS	3520/1630H	12TV, 12 radio	3/4	28(.066)	Feeds to TARBS Australia and PAS-8 (DM)
	TVK Cambodia	3448/1702H	1TV	1/2	6(.312)	**FTA**
	TARBS/Th5	3480/1670H	12 TV+radio	2/3	26(.667)	**3FTA**. TV5, VTV4, ATN Bangla (DM)
	KCTV/Korea	3424/1726H	1TV	3/4	3(.366)	Not 24 hour
	Thai Global	3425/1725V	up to 7?	2/3	27(.500)	FTA (reaches SE Australia)
InSat 2E/83	**ETV mux**	4005/1145V	6+ TV	3/4	27(.000)	Several ETV now here, wide beam
	Hyd Dig 2E	3910/1240V	1	3/4	5(.000)	SCPC, OK E Aust wide beam
	Kairali TV	3699/1451V	1	3/4	3(.184)	SCPC, OK E Aust wide beam
	Indian mux	3643/1507V	3	3/4	19(.531)	corrections 12/02
	ETV Mux#2	3485//1665V	4+TV	3/4	27(.000)	Several new ETV here, Asia beam
	Sky Bangla	3430/1720V	1TV	3/4	6(.000)	New - November 2002
ST1/88E	MMBN	3632/1518V	12TV	3/4	26(.667)	Nagravision, some FTA, erratic
NSS6/96E	**New MUX**	12 729V	3 + TV	7/8	27(.500)	Close to horizon, LNBf skews towards Hz!
	Test MUX	12 688V	? + TV	3/4	28(.066)	PowerVu, may be NE Asia beam, tests
	Test MUX	11 592H	? + TV	7/8	26(.000)	TARBS was testing here - uplifted from Thaicom
As2/100.5E	**Shandong TV**	4070/1080H	1TV	3/4	6(.811)	New - October 2002
	Euro Bouqt	4000/1150H	6TV, 21r	3/4	28(.125)	FTA TV + radio
	Sichuan TV	3946/1204H	1TV + radio	3/4	4(.420)	New April 2003
	Reuters News	3905/1245H	1TV	3/4	4(.000)	Was 3923H, sometimes **FTA**
	WorldNet	3880/1270H	4+/28radio	1/2	20(.400)	FTA, multiple audio services
	Hubei/HBT	3854/1296H	1	3/4	4(.418)	FTA SCPC, teletext, 2 radio
	Hunan/SRT	3847/1303H	1	3/4	4(.418)	FTA SCPC, teletext
	Guan./GDT	3840/1310H	1	3/4	4(.418)	FTA SCPC, radio APID 81
	In. Mongolia	3828/1322H	2	3/4	8(.397)	FTA. #1 Mongolian, #2 Mandarin
	APTN Asia	3799/1351H	1	3/4	5(.632)	Sometimes **FTA**; also 3895Vt
	Reuters/Sing	3775/1375H	1	3/4	5(.631)	**FTA** & CA
	Liaonin/Svc2	3734/1416H	1	3/4	4(.418)	FTA SCPC, radio APID 256
	Jiangx/JXT	3727/1423H	1	3/4	4(.418)	FTA SCPC, teletext, radio APID 81
	Fujian/SET	3720/1430H	1	3/4	4(.418)	FTA SCPC, + radio APID 80
	QinghaiTV	3713/1437H	1	3/4	4(.418)	FTA SCPC, 2radio (APID 80)
	Henan/Main	3706/1444H	1	3/4	4(.418)	FTA SCPC, + radio
	Egypt/Nilesat	3640/1510H	7+, radio	3/4	27(.850)	Thru TARBS Aust, occ. **FTA**
As2/100.5E	**Macau MUX**	4148/1002V	5TV	3/4	11(.850)	5 chs TV, FTA, some tests
	Feeds	4086/1064V	1	3/4	5(.632)	FTA SCPC feeds
	Dubai MUX	4020/11430V	4+, radio	3/4	27(.500)	FTA , sometimes includes sport
	Jilin Sat TV	3875/1275V	1	3/4	4(.418)	FTA SCPC, + radio
	Shanghai BN	3846/1304V	1	3/4	4(.800)	V1110, A1211 + 2 radio ; FTA Jan 2003
	HeiLongJian	3834/1316V	1	3/4	4(.418)	FTA SCPC
	JSTV	3827/1323V	1	3/4	4(.418)	FTA SCPC, + radio
	Anhui TV	3820/1330V	1	3/4	4(.418)	FTA SCPC + radio
	ShaanxiQQ	3813/1337V	1	3/4	4(.418)	FTA SCPC, radio APID 81
	Guan/GXTV	3806/1344V	1	3/4	4(.418)	FTA SCPC, radio APID 257
	Fashion TV	3795/1355V	1	3/4	2(.626)	FTA as of May 1, 2003
	Saudi TV1	3660/1490V	7+/tests	3/4	27(.500)	FTA MCPC, Yemen, MBC Europe tests
As3S/105.5E	Telstra I-Net	12.596V	no TV	5/6	30(.000)	Signal useful for dish testing - no TV
	Zee bouquet	3700/1450V	10TV	3/4	27(.500)	Mediaguard : Conax CA, 2 have been FTA
	Ch News Asia	3706/1444H	1TV (+)	3/4	6(.000)	New September 2003, English + V1160, A1120
	Arirang TV	3755/1395V	1	7/8	4(.418)	FTA SCPC, New PIDs V3601, A3606 June 2003
	Now TV +	3760/1390H	up to 8TV	7/8	26(.000)	CA + NOW, B'berg, Indus, MTA FTA
	Star TV	3780/1370V	7(+)TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Star TV	3840/1310H	7(+) TV	7/8	26(.850)	NDS CA (Pace DVS211, Zenith)
	Star TV	3860/1290V	5(+)TV	3/4	27(500)	NDS CA (Pace DVS211, Zenith)
	Star TV	3880/1270H	20(+)TV	7/8	26(.850)	NDS CA (Pace DV211, Zenith) In transition 06-2003
	Star TV	3920/1230H	4+ TV	7/8	26(.850)	Star Sports Asia (+), **FTA** NTSC, V512, A640 English
	Star TV	3940/1210V	6(+)TV	7/8	26(.850)	NDS CA as above, may NOT be operational
	CNNI	3960/1190H	8(+)TV	3/4	27(500)	PowVu CA, new SR Apr 29
	StarTV	3980/1170V	6+TV	3/4	28(.100)	NDS CA; Star News India **FTA** VPID 514, APID 648
	Star TV	4000/1150H	8(+)TV	7/8	26(.850)	NDS CA w/ **4(Chinese) FTA**
	Sahara digital	4020/1130V	8TV	3/4	27(.250)	New Sr September
	Pakistani TV	4090/1060V	1+TV, radio	3/4	6(.666)	New to digital June 2003, V308, A256
	Sun TV	4095/1055H	1	3/4	5(.554)	"History Channel" testing SCPC
	TVB Mux	4010/1040H	3	3/4	11(.230)	**MATV Chinese movies FTA**, + CA
	CCTV bqt	4129/1021H	4(+) TV	3/4	13(.240)	moved from 4115
	Zee Bqt #2	4140/1010V	8(+) TV	3/4	27(.500)	Mediaguard (SECA) CA
Cak1/107.5	Indovision (S-band)	2.535, 2.565, 2.595, 2.625, 2655	33(+) TV	7/8	20(.000)	NDS CA using RCA/Thomson, Pace IRDs; **2.535 has 2 FTA**
T'Kom/108E	**IndoBqt**	3460/1690H	up to 6	3/4	28(.000)	also 3586H/17 500, 3496H/19 615
C2M/113E	**TPI**	4185/965V	1	3/4	6(.700)	FTA SCPA; NT/NC only
	TVE Asia-Africa	4160/990H	1	3/4	5(.632)	New August 2003
	Anteve	4144/1006V	1	3/4	6(.510)	change from 4055V, FTA SCPC
	Indo Mux	4080/1070H	5+ TV	7/8	28(.125)	Global TV - erratic new FEC 06/03
	Indostar	4074/1076V	1	3/4	6(.500)	FTA (new 06-03); V2201, A2202
	SCTV	4048/1102V	1	3/4	6(.618)	FTA SCPC; NT, New Caledonia only
	Indonesian Mux	4000/1250H	6+ TV	3/4	26(.085)	undtable platform - not always there
	Satelindo	3935/1215H	1	3/4	6(.700)	test card - only - reported
	Bali TV	3926/1224H	1	3/4	4(.208)	FTA, may not be active
	Indo MUX	3880/1270H	3+ TV	7/8	28(.121)	FTA; Sr change 01/03; erratic

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
	GlobalMUX	3760/1390H	up to 11 TV?	7/8	28(.121)	test cards (11), new Sr/FEC 01-03
	Brunei/Sing	3733/1417H	1TV	3/4	6(.000)	FTA share time; Brunei 23 hrs, Sing 1 hr
	TBN/Trinity	3727/1423H	1 TV	3/4	3(.000)	New PIDs 02/03; V177, A180
	RCTI	3473/1677H	2	3/4	8(.000)	FTA SCPC; Australia, New Caledonia, some English
	Myawad TV	3706/1444H	1	3/4	5(.924)	Tests; may be arratic if even operating
As4/122E	Speedcast data	4120/1030H	0 - data only	3/4	27(.500)	3 data chs, useful for dish tracking
Jc3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(.000)	PowerVu; some FTA (Ch. 1 & 3)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)	CA & FTA NTSC: Japan, Taiwan
Jc2A 154	Cnet	3880/1270V	up to 12	3/4	30(.000)	Cnet (Taiwan) tests; not full time
	BYU tests	3.915/1245V	2	3/4	3(.703)	Erratic service; very strong NZ and Australia
MeaSs2	New Mux	12.532H	17	3/4	41(.500)	New Sept 2002; unknown source
	Astro Mux	11.602H	up to 17TV	3/4	41(.500)	Aust East beam - **3 FTA** + 14 CA
	VTV MUX	11.522V	3 TV	3/4	9(766)	WA only? Skew path, intended Asia
B3/152	BTV tests	12.407V	6+ TV	2/3	30(.000)	repeat of C1 12.407V
	Globecast tests	12.531V	3 + TV	2/3	15(.000)	ERT, Thai TV, Siagaram, TRT others test here
	Aurora tests	12.637V	5+ TV	2/3	30(.000)	CLK, BTV3, Sky Racing (CA) feeds, tests
C1/156	Globecast	12.367V/T2	13TV, 12radio	2/3	30(.000)	Aust, NZ 90 cm; **6 TV FTA**
	Aurora	12.407V/T3	13TV, 12 radio	2/3	30(.000)	Aust, NZ 90 cm
	Aurora	12.527V/T6	11TV, 19 radio	3/4	30(.000)	Australia NA only (leakage to Norfolk, New Cal)
	Aurora	12.567/T7	2+ radio (only)	2/3	30(.000)	Aust, NZ 90 cm
	(tests)	12.607V/T8	Clone of 12.518H	3/4	27(.800)	Tests
	Aurora	12.720V/T10	10TV, 19 radio	3/4	30(.000)	Australia NA only (leakage to Norfolk, New Cal)
	Austar	12.278H/T11	31 data (some TV)	3/4	29(.473)	CA, subscription available Australia
	Optus/Foxtel	12.358H	11TV	3/4	27(.800)	Tests (CA)
	Optus/Foxtel	12.398H/T13	10 TV	3/4	27(.800)	Tests (CA)
	Austar/Foxtl	12.438H/T14	12TV	3/4	29(.473)	CA, subscription available Australia, Norfolk
	Optus/Foxtel	12.478H	9 TV	3/4	27(.800)	Tests (CA but TVSN **FTA**)
	Austar/Foxtl	12.518H/T16	11TV, 8 fill, 1 radio	3/4	29(.473)	CA, subscription available Australia, Norfolk
	Austar/Foxtl	12.558H/T17	11TV, 124 radio	3/4	29(.473)	CA, subscription available Australia, Norfolk
	Austar/Foxtl	12.598H/T17	11TV	3/4	29(.473)	CA, subscription available Australia, Norfolk
	Optus/Foxtel	12.638H	8TV, 24 radio (*)	3/4	27(.800)	Tests (CA); * - 24 radio not operating as of Oct 05
	Austar/Foxtel	12.688H/T20	12TV	3/4	29(.473)	CA, subscription available Australia, Norfolk
B1/160	**ABC NT fd**	12.258V	1TV, 3 radio	3/4	5(.026)	V832, A833; occ. power drops -10 dB
	Occ. feeeds	12.380H	1 TV - *	3/4	6(.111)	* - plus 12.451H, 12.460H
	Occ. feeds	12.384V	1 TV - *	3/4	6(.111)	* - plus 12.293V, 12.402V, 12.411V
	Net 7 service	12.397H	1	3/4	7(.200)	Full schedule less commercials - links
	Central 7	12.354H	1TV + 1 radio	3/4	3(.688) (*)	V1280, A1281; occ. 2nd channel (* Sr varies)
	Imparja mx	12.379H	2TV + 8 radio	3/4	5(.424)	PIDs vary; also try 12.360, 12.370
	7 digital feeds	12.397H	1TV	3/4	7(.200)	occ. digital feeds; typ fta
	Feeds to NZ	12.411V	1 TV	3/4	6(.111)	Often NTSC; USA-Australia-NZ
	Sport feeds	12.420V	1	3/4	6(.110)	Weekend footy feeds reported-FTA
	SBS Mux	12.420H	3+ TV, 2+ radio	5/6	12(.600)	Also 12.420H same params; SBS HDTV + w-s
	TVNZ DTH	12.456V	5+TV	3/4	22(.500)	FTA 4 channels (TVNZ x 4); + **RWC** will be here
	Nine Net	12.512H	1 TV typ.	3/4	5(.632)	testing digital feeds; Sr may vary
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.644/671V	9TV	3/4	22(.500)	NDS CA, subscription available NZ
	ABC HDTV	12.603H	5TV	7/8	14(.300)	also 12..626,.643,.670, 688, & 706H
	Sky NZ	12.707/733V	8+TV	3/4	22(.500)	NDS CA, subscriptions available NZ
	Mix 106.3	12.574H	1 radio + data	3/4	1(.851)	Radio SCPC is "cover" for high speed data
P8/166	TARBS3	12.326H	13TV + radio	3/4	28(.066)	TPG/EurodecMDS CA, occ. FTA
	TARBS	12.526H	13TV + radio	3/4	28(.066)	TPG /Eurodec MDSCA, **radio FTA**
	TARBS2	12.606H	13TV + radio	3/4	28(.066)	TPG/Eurodec MDS CA; **TRT FTA**
	TARBS5	12.646H	testing	3/4	28(.066)	TPG/Eurodec MDS CA
	TARBS4	12.726H	13TV + radio	3/4	28(.066)	TPG/Eurdec MDS CA; **Thai TV, FTA**
	JEDI/TVB	12.686H	11+ TV	3/4	28(.126)	June 2002-Irdeto-2 CA
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(.500)	Dateline west; east PAS2, 3901
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)	PowVu CA
	NHK Joho	4060/1090H	7TV, 1 radio	3/4	26(.470)	PowVu CA & **FTA**; subscription available
	FOX Mux	4040/1110V	up to 5TV	7/8	26(.470)	was PAS-2, previously 3992Vt
	NET +	4121/1029V	1 TV	3/4	4(774)	NET25 + FTA; new PIDS April; reload
	ESPN USA	4020/1130H	8+TV, data	3/4	26(.470)	PowVu CA; ch 11 DCP-CCP bootload; new FEC
	Discovery	3980/1170H	8 typ.	3/4	27(.690)	PowVu/CA (some audio **FTA**)
	CalBqt/Pas8	3940/1210H	up to 3+ FTA	7/8	27(.690)	PowVu CA & **FTA (EWTN +)**
	CNBC HK	3900/1250H	up to 7TV	3/4	27(.500)	NDS CA (6 channels); one testcard FTA
	FilipinoMUX	3880/1270V	up to 8TV+radio	5/6	28(.694)	**Myx FTA** V1960, A1920 + radio FTA
	TaiwanBqt	3860/1290H	12TV + 30 r	5/6	28(.000)	Mixed **FTA** & CA; Taiwan Hallmark, STC
	CCTV Mux	3829/1321H	up to 4	3/4	13(.240)	PowVu FTA, replaces PAS-2 svc
	TVBS-N	3836/1314V	**1FTA**, 4+ CA	3/4	22(.000)	Difficult because of CCTV cross pole
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)	was As2; PowVu CA
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)	PowerVu
	Discovery Asia	3764/1386V	Up to 6 TV	3/4	19(.850)	PowerVu; Asian MUX; new parameters Sept '03
	MTV	3740/1410H	8	2/3	27(.500)	**# 8 MTV China FTA V289, A290)**; rest CA
P2/169E	Off-shore rigs	12.281V	2+ TV, radio	2/3	27(.500)	PowVu CA, WIN, ABC NT
	WA PowVu	12.637(.5)V	4TV, 8 radio	1/2	18(.500)	PowVu CA, WA only - D9234
	NBN-TV	4126/1024V	1TV	3/4	3(.075)	3m up (NZ), 1.8m up Australia
	TARBS	4090V/1060V	9TV + radio	3/4	21(.000)	Occ FTA (Chile +); power reduction Sept. 2003
	Feeds	4037/1113H	1+ TV	2/3	6(.620)	Sporting feeds (occassional)
	Feeds	4027/1123H	1+TV	2/3	6(.620)	Sporting feeds from USA (occassional)
	Feeds	4023/1127V	1 +TV	3/4	13(.328)	feeds to (USA) pay-TV
	Feeds	3966/1184V	1	2/3	6(.620)	PowVu (FTA) occ feeds
	Feeds	3957/1193V	1	2/3	6(.620)	PowVu (FTA) occ. feeds
	Feeds	3929/1221V	1	3/4	10(.850)	PowVu (FTA) occ sport feeds
	Feeds	3912/1238V	1	2/3	6(.620)	PowVu(FTA) occ. feeds
	Feeds	3898/1252V	1	2/3	12(.000)	PowVu (FTA) occ. feeds
	Middle East	3836/1314V	4 typ	3/4	13(.331)	**Irdeto 2 CA - subscriptions avail; Strong Tech**
	Feeds	3803/1347V	1	3/4	6(.000)	PowVu (FTA) occ sport feeds
	PAS/BBC mux	3744/1406V	3	3/4	21(.500)	**BBC, test card FTA**, others nominally CA

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
(PA2/169E)	**Feeds**	4040/1010H	1	3/4	10(.850)	PowVu occ FTA feeds
	7thDayAdv.	3872/1278H	1	3/4	6(.620)	Sat, Sun 0030, 0900+UTC?)
	Feeds	3868/1182H	1	2/3	6(.620)	FTA (occ sport), also try 3863,Sr6.100
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498)	FTA-typ NTSC-occ sport, live Shuttle
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)	PowVu CA + **FTA** (BBC gone)
	HK bouquet	3850/1300H	up to 8	2/3	24(900)	was 4148Vt; some FTA
	occ feeds	3776/1374H	1 typ	3/4	5(.560)	occ feeds, typ FTA; also Sr 5.600
	Korean Bqt	3771/1379H	1	3/4	9(.041)	Korean MUX, reload 02/03
I804/176E	**iPSTAR**	12.619H	1	2/3	25(.220)	Tests, late May start, also 12.646H
	Tests-NZ beam	12.646H	1	3/4	22(.418)	Testing possible data links, June 2003
	RFO Poly	4027/1123R	1TV	3/4	4(.566)	SE spot beam; was 4027LHC
I701/180E	TNTV	11.060&11.514	9	3/4	30(.000)	east spot; 10TV + r each, vertical pol.
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(.000)	1+ **FTA**, MediaGd "2"; + 10.975 weaker
	TVNZ	4195/955RHC	1	3/4	5(.632)	DMV/NTL early vers., occ feds, typ ca
	TVNZ/BBC	4186/964RHC	1	3/4	5(.632)	DMV/NTL early vers. occ feds, typ ca
	TVNZ	4178/972RHC	1	3/4	5(.632)	DMV/NTL early vers., occ feds, typ ca
	AFRTS DTS	4175/975L	3 TV, 3 radio	2/3	3(680)	'DTS' **radio, TV audio FTA** some IRDs
	TVNZ/Aptn	4170/980RHC	1	3/4	5(.632)	DMV/NTL early vers. occ feds, typ ca
	TVNZ/feeds	4161/989RHC	1	3/4	5(.632)	DMV/NTL early vers., occ feds, typ ca
	RFO-Canal+	4086/1064L	4TV, radio	5/6	12(.041))	east hemi 20.5 dBw +; new Sr
	TVNZ feeds	4052/1098RHC	1	3/4	5(.632)	DMV/NTL early vers.,occ feeds, typ ca
	TVNZ feeds	4044/1106R	1	3/4	5(.632)	SCPC, mixed CA and **FTA** feeds
	NZ Prime TV	4024/1126L	1	2/3	6(.876)	PowVu CA; Auckland net feeds
	NBC to 7 Oz	3960/1190R	1	7/8	6(447)	CA, Leitch encoded
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(.000)	New Feb 2002; very strong NZ, Pacific
	Ioarana	3772/1378L	1	3/4	4(.566)	FTA SCPC, East Hemi Beam-Tahiti
	TVNZ	3846/1304R	1	3/4	5(.632)	SCPC, mixed CA & **FTA**, feeds
	10 Australia	37691381R	4	7/8	20(.000)	PowVu CA & **TBN-JCTV FTA**
	USA feeds	3749/1401R	4?	?	26(400)	16-QAM (not MPEG-2 compatible)

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!

Aston Simba 201. Embedded SECA (Zee, Canal +); review SF#97. MediaStar 61-2-9618-5777.

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. Av-COMM P/L, 61-2-9939-4377.

AV-COMM R3100(A). FTA, good sensitivity, ease of use exc (review SF May 2002). See above contact.

Benjamin DB6600-CI. FTA, Foxtel/Austar w/CAM+card. Autosat Pty Ltd 61-2-9642-0266 (review SF#72)

Coship 3188C. Review SF#107. Blind search FTA rcvr. Presently available from Satlink NZ www.satlinknz.co.nz. Buy with caution.

eMTech eM-100B (FTA), eM-200B (FTA + CIx2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)

Humax F1-CI. Primarily sold for TRT(Australia), does (limited) PowerVu (not Optus Aurora approved).

Humax ICRI 5400 (Z). Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available, SF#76.

Humax IRCI 5410 (Z). Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available.

Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26)

Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.

Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.

ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI interface slot irdeto 1 & 2; review SF#109. Sciteq 61-8-9409-6677.

MediaStar D7. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. 61-2-9618-5777

MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. MediaStar Comm. Int. 61-2-9618-5777

MediaStar D10. FTA and Irdeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.

MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738

Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. SF#95, p. 14.

Nokia 9200/9500. When equipped with proper software, does Aurora, pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)

Pace DGT400. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818). UECs replacing; Sept 18 (2003) "drop-dead" day; all were to have been "turned off" on that date (in fact, those with V1.13 CAMs may still be working).

Pace DVR500. Original DGT400 modified for NBC (PAS-2)/RSA use, with CAM equivalent to DGT400 but more reliable.

Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version.

Panasat 520/630/635. MCPC FTA, Irdeto capable, forerunner UEC 642, 660. Out of production, spares fax ++27-31-593-370. No longer wotrk with Austar/Foxtel.

Panasonic TU-DS10. FTA + Irdeto CA; one of 2 IRDs approved by Optus for Aurora, but never available in Australia.

Phoenix 111, 222. PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH(below)- 222; terminated

Phoenix 333. FTA SCPC, MCPC, analogue + dish mover. Detailed SF review SF#51. SATECH 61-3-9553-3399.

Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)

PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, GWN+ PAS-2 Ku, CMT etc). Scientific Atlanta 61-2-9452-3388.

PowTek. Blind Search Chinese sourced, field tests rate it highly. Possible source www.adigitallife.com (.au?)

Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.

SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-2749)

SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above).

Strong Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).

Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.

Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, Aurora. Strong Technologies 61-3-8795-7990.

Strong 4800 II. SCPC, MCPC CAM slots x 2 for Aurora +, Zee, Canal +. Strong Technologies (above); review SF#103.

Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84); Strong Technologies, # above.

UEC Atlas/Titan. New July 2003, replacing DGT400 for Austar. No SCART, L-band loop; also available Rural Electronics 61-2-6361 3636.

UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faultyP/S. Norsat 61-8-9451-8300.

UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel-limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.

UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers; propensity to fall off back of trucks.

Winersat DigiBox 200. C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ, fax 64-9-814-9447

Xanadu. DVB compliant special-priced receiver for members of SPACE Pacific (Av-comm Pty Ltd, tel +61-2-9939-4377)

Accessories:

Aurora smart cards. MYCRYPT (Irdeto V2) cards now available (Oct. 2003), Sciteq 61-8-9409-6677.

PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)

WITH THE OBSERVERS

AT PRESS DEADLINE

Channel NewsAsia on AsiaSat 3S (3706Hz/Sr6.000, 3/4) is a permanent service (VPID 1160, APID 1120) according to AsiaSat. The channel provides a FTA English language all-news/all-the-time format which adds an Asian perspective to similar CA offerings imported from North America by CNN and Fox.

ApStar2R/76.5E: "TV Sri Lanka, 3652Hz, Sr 6.500, 3/4 advising viewers - 'We will become encrypted and viewers will require a receiver with embedded Viaccess or a (universal) Magic Cam or Viaccess module'." (**D. Leach**, NSW)

AsiaSat 2/ 100.5E: "EuroSport News, briefly on Dubai mux 4020V, is now gone." (**PH**) "Myawady TV 3766 is history." (**DL**, NSW)

AsiaSat 3S/105.5E: "Sahara digi-mux (4020V) has returned to original parameters - now, 27.250, 3/4. The FTA Star News India service, reported on 3840V, is in fact on 3780V, 28.100, 3/4 with VPID 514, APID 648. The Star Asia 3840V service now has a Sr of 26.850 (not 27.500). Star's 3940V no longer (listed 26.850, 7/8) may not be running currently - or my dish is too small for FEC 7/8!" (**RN**, NSW) "Sahara Samay Mumbai is new FTA on 4020V; VPID 515, APID680." (**PD**) "CNN Radio remains FTA (3960H, Sr 27.500, 3/4; APID 1122)." (**LK**)

NSS6/96E: "On 1.8m dish, Humax 5410Z, find 12.729V, Sr 27.500, 7/8 with Fashion Men, Fashion TV and NTD TV." (**Jason B**, Perth)

Optus B1/160E: "Mix 106.3 (12.574H, Sr 1.851, 3/4) has an audio PID of hexadecimal 1063 (decimal 4196) and the data rate is a miserably miserly 0.122 Mbit/s. However, there is a text PID of hexadecimal 1068 (decimal 4200) with a huge data rate of 2 Mbit/s." (**IF**, Qld) "Central-7 has joined the Imparja initiated 'moving-symbol-rate' procedure (12.354H), possibly because of the Rugby World Cup coverage starting October 10?" (**MD**, NSW) (Ed's note: We are not reporting the new Sr here for the same reason we have ceased updating Imparja's musical-chair symbol rates.)

Optus B3/152E: "12.531V, Sr15.000, 2/3 has Sigaram TV (VPID1160/APID1120)." (**Petrino**) "ERT Sat, TRT, Thai TV Global and others seem to come and go with abandon on 12.531V." (**DM**, NSW) "12.637V, Sr 30.000, 2/3 has CLK, BTV3 and Sky services." (**Jason B**, Perth)

Optus C1/156E: "The 12.358H 'homing channel' loading as Sr 27.800, 3/4 has five transponders as a part of the NIT (loading table) - 12.358, 12.398, 12.478, 12.638 all H and now 12.688H which continues to be 29.473, 3/4." (**IF**, Qld) "Optus/Foxtel was using Sr 27.800, FEC 3/4 on 12.305V and 12.607V as well as 4 Hz transponders (see listing, p. 28) during late September." (**NS**, Vic)

PanAmSat PAS2/169E: "TARBS World mux 4090V, Sr 21.000, 3/4, has reduced power by perhaps 6 dB making it too weak for even 3m size dishes in NSW - costs less than encryption!" (**GC**, NSW) "TARBS 4020V mux has Iran TV replacing NITV (V512, A640) and Tapesh TV is gone, now test card." (**PK**)

Solar interference to the Satellite is affecting our signal.

This disturbance may occur for periods of up to five minutes. We apologise for this unavoidable disruption to our service.

One approach to advising viewers of equinox "solar outage" loss of signal; Disney Australia saying their inward bound link is down. (photo-mp)

PanAmSat PAS8/166.5E: "CNBC's NDS (3900H, 27.500, 3/4) package is (NDS) CA but a test card remains FTA." (**AI**, Vic) "MTV China remains FTA (3740H, 27.500, 2/3) - the only FTA in the mux - but PIDs are now VPID 0289/decimal-0121 hexadec and APID 290/decimal-0122hexadec." (**NS**, NSW) "Discovery CA mux has converted from 3769V, Sr 13.240 to 3764V, Sr 19.850, 3/4 with six programme channels for Taiwan, Japan and Australia (PowVu)." (**Albert**)

Thaicom 2-3/78E: "Dutch BVN, RNW3 and French Fashion TV are now FTA 3671, Sr 13.333, 3/4." (**NS**) "ETTV News, AsiaNet News, Kairali Channel have left 3671H." (**BW**) "TARBS muxes 3520 and 3640 (Sr 28.066, now FEC 2/3) have been FTA on and off during September." (**DM**, NSW)

Soapbox: "Using Nokia with DVB2000, it appears the PID structure of the newly activated Sr 27.800 C1 transponders, the NDS in use for AsiaSat 3, CNBC on PAS-8 using NDS, and the Sky NZ B1 transponders using NDS are all different. What this may say is NDS coming to Australia *may not be* detectable with the standard DVB2000 software." (**Anon**, Vic) "End of Footy season - all FFX channels have been relabelled FFC and the one channel previously called FFC is now C.E. which stands for 'Current Events'. In fact, it is a continuous promotion for pay-per-view. C.E. loads as channel 14 on Foxtel, FFC loads as 15. Austar carries only FFC, channel 54." (**FI**, Vic) "Sky NZ announcing end of Hallmark Channel (October 27) and CNBC (November 30); adding UKTV

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. Photos of yourself, your equipment or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady. Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for November15th issue: November 3 by mail or 5PM NZST November 5th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

Nokia with DVB2000 still has unique abilities

For the past three months, much has been observed and reported (perhaps with over enthusiasm) about 'Blind Search' all-finding receivers originating in China. There remains a number of DVB2000 equipped Nokia abilities which apparently cannot be duplicated by these blind-search IRDs. The following (source: mp) report highlights the depth and quality of 'raw information' which a properly equipped Nokia in the hands of a skilled user can provide.

"The Nokia will detect and reveal not only what encryption a service is using but when two (or more) encryption formats are in use, the full PID information for each. For example, it tells you Globecast on C1 (12.367V) is simulcrypting Irdeto, S/A PowerVu; that Zee TV on As3S uses Mediaguard on both 3700 and 4140 but also uses Conax on 3700. All of this is relevant because of the recent appearance of a new set of C1 horizontal transponders and the possible reactivation of what originated as the 'Optus Bouquet' (which differs from the more well known Foxtel and Austar bouquets). This bouquet currently includes 39 TV programme channels (38 in use) and 24 radio (not in use October 5). On **12.638Hz** (Sr 27.800, 3/4) the 'Optus Bouquet' has 1) ABC, 2) TWC, 3) EXPO, 4) FOX8, 5) SBS, 6) CMC, 7) MOV1, and 8) MTV. On **12.358Hz** (Sr 27.800, 3/4) there are [9 not in use], 10) NICK, 11) MOVX, 12) MOVG, 13) WMOV, 14) [V], 15) HALL, 16) DISC, 17) DISN, 18) LIFE, 19) ENCR and 20) Shw2. On **12.478Hz** (Sr 27.800, 3/4) appear 21) FS1, 22) FS2, 23) NGEO, 24) MAIN, 25) SKYR, 26) OVAT, 27) CNBC, 28) TVSN [FTA] and 29) ESPN. On **12.398Hz** (Sr 27.800, 3/4) are 30) RAI, 31) ANT, 32) FOXN, 33) Blm, 34) C.E., 35) TWC, 36) FFC, 37) FFC, 38) CNNI, 39) Cart. Note that only 12.398Hz was originally activated (July-early August C1 changeover) and as SF#108 reported (p. 20) *at that time* it was Sr 29.473 and FEC 3/4 (the 'standard' numbers for Foxtel/Austar). Also note **12.638Hz** (Sr 27.800, 3/4) is a part of this renewed 'Optus Bouquet' but at this time the 24 radio channels (r01 to r24) are not active. Of further interest, these programme channels do not appear on the Austar and Foxtel 'normal' bouquets. On the new transponders cited, the PIDs expressed in decimal are identical on each as follows (VPID, APID, PCR): (**1**/10/21/30) 1011, 1012, 1011; (**2**/11/22/31) 1021, 1022, 1021; (**3**/12/23/32) 1031, 1032, 1031; (**4**/13/24/33) 1041, 1042, 1041; (**5**/14/25/34) 1051, 1052, 1051; (**6**/15/26/35) 1061, 1062, 1061; (7/16/27/36) 1071, 1072, 1071; (**8**/17/28/37) 1081, 1082, 1081; (18/29/38) 1091, 1092, 1091; (19/39) 1101, 1102, 1101; (20) 1111, 1112, 1111. The ABC on **1**) has a text PID of 1016 while SBS on **5**) uses text 1056. The data they are feeding appears not to be teletext. Other non-teletext but teletext-appearing data streams are found on 12.558Hz (Sr 29.473, 3/4) with a text-PID of 584 (NGEO) and 12.688Hz (Sr 29.473, 3/4) text-PID 577 (SHOW). On C1 vertical, 12.305 and 12.607 (both Sr 27.800, 3/4) have been running without loading tables. Additionally, 12.647V (Sr 30.000, 2/3) is also still running without loading tables - and may be Optus Internet data. This final observation: While Nokia with DVB2000 detects NDS encryption (As3S for example) it may not detect ALL NDS formats. This says that rumours Foxtel with Sr 27.800 is 'testing' their new NDS CA format remain unproved at this time."

November 1, History Channel December 1, Disney December 24." (**CS**, NZ) "Australia's digital TV mastermind Senator Alston has resigned from his post, rumoured to be headed for a new diplomatic post assignment." (**NF**, Vic) "Someone calling themselves 'Globalsat' with a registered business location in Newstead, Queensland but now relocated to Adelaide is offering receivers, antennas for very attractive pricing. Does anyone know whether they are 'for real'?" (**ND**, NT) "Noticed press release from Murdoch's NDS stating 'set-top box integration facility' in Seoul (Korea) has now completed VideoGuard conditional access and NDS Core middleware projects with a number of brand-name suppliers; eMTech, Global Tech, Hyundai, Humax, LG Electronics and Samsung. Has anyone ever seen NDS format CA equipment from any of the firms listed?" (**William T**, NSW) "Japan and Korea have agreed on setting aside 2.630 - 2.655 GHz for DMB (Digital Mobile Broadcasting). This S-band service will be a first in the world but ITU plus China agreement remains to be done. Target date for launching first satellite carrying this service is 2006." (**Leroy**, Singapore) "Another piracy card raid, this time in Perth region, apparently netted six 'business locations' dealing in clone Irdeto cards. Reports say retail shops dealing in 'alarm and electrical businesses' were targeted by Federal Police." (**Paul H**) "Seven and Ten Networks are looking more favourably on possibility their services can be included in Foxtel (although possibly not Austar) C1 mux package when Foxtel does massive expansion during first quarter of 2004. The day of shutting down terrestrial TV transmitters in Australia looms ever closer. But it is not a done deal - Australia's conversion to HDTV would be in jeopardy if ABC, SBS, 7, 9 and 10 all moved to Foxtel satellite simply because the bandwidth consumed for HDTV is potentially greater than even C1 can supply. " (**IF**, Qld) "While some Pace DGT400 owners report their receivers crashed September 18, others using version 1.13 CAMs say they are still up and running." (**DL**, NSW) "Is there any evidence to suggest Intelsat 701 (180E) is slightly or more off of Clarke Orbit Belt? The sun alignment data from the Intelsat web site suggested the maximum solar outage would occur September 7 for Auckland but for us it was September 9th - suggesting 701 is in fact south of the equator-belt." (**PS**, Auckland) (Editor note: Two days "off" would translate to a very significant distance south of the equator. Perhaps the answer is simply that Intelsat's calculations are off?) "I was watching (NZ) Prime TV and there was a commercial offering a 1.5m dish system, decoder, for $699 installed (B1 only) or $899 (B1 + B3, including ABC-TV, an Arabic and an Indian channel). Their contact is www.aerialmaster.co.nz." (**Bruce Johnston**, Wellington) "Northern Territory Department of Planning and Infrastructure has law making it illegal to install any satellite dishes 'on the roof' without a piece of paper called, 'Certificate of Compliance'. Alice Springs apparently has many 'illegal' dishes, some estimates run as high as 600. With the roll-out of Austar services into NT, roof mounted dishes in the 85cm size region (or smaller) are just ahead. If the NT government elects to push this law, the one-by-one Certificate of Compliance procedure is expected to raise the cost per installation from $300 to as much as $900. Throughout NT, an estimated 4,000 dishes now operating - a number expected to double within 90 days of Austar's rollout and double again within 9 months. The NT Department of Planning and Infrastructure has so far taken an adversarial position in this matter." (**DN**, NT) "Sharp is rushing to market a 15" LCD TV receiver package with a built-in WiFi receiver and companion WiFi standard 802.11b LAN technology 'transmitter'. This is a SmartLink wireless package and users will be able to simply connect any A-V source (such as a DVD player) to the transmitter portion and then with the (Sharp) battery operated TV, wander about your home/property 'taking the remote programming source' with you. What's new here? Most links use a *broadband* 2.4 GHz approach, requiring 5-10-20 MHz of bandwidth to send V + A in a wireless mode. This one is 'narrowband' WiFi channel width - better range, coverage, without tying up big chunks of bandwidth. Sharp's model number is AQUOS LC-15L1U-S." (**Jeremy C**, Los Angeles) "When the TVNZ Rugby World Cup coverage is over (after mid-December), the programme channel established on B1 for this purpose will revert to a test status. Past tests of satellite for creating fully functional widescreen have not been perfect and TVNZ hopes to work out the remaining bugs at that time." (**DgS**, Auckland) "A site of interest which allows people who have tested various pieces of equipment is http://www.satcritics.com/hardware.php (**CS**, NZ). "Broadband amplifier. Motorola has a new 'BDA / Broadband Drop Amplifier' with separate (110 or 220Vac) power supplies, covering 52 - 1000 MHz "forward" (aerial/cable system 'in') and 5 - 40 MHz 'reverse' (out of the home/distribution plant back into the master cable plant). Optionally, reverse can be 5 - 62 with forward 85 - 1000 MHz. The specifications are built around 1 GHz Gallium Arsenide technology, a 2.5 dB noise figure (which is pretty outstanding at 1 GHz), 15 dB gain, with single, dual and quad output port versions. Motorola has also designed it for remote power, and sealed the actual amplifier portion for outdoor/weathering

installations. Another device is at Radio Shack (USA) with their 'Digital Cable TV Line Amplifier' which also covers 54-1000 MHz 'forward' plus 5 - 40 MHz reverse with 15 dB gain. Product number 15-1171, this model has been discounted from US$49.95 to $29.95. " (**M. Gold**, Chicago) "Reference Toroidal Ku-band antenna (p. 22, SF#109); what about a C-band version?" (**SG**, Bangkok) (Editor's note: In theory, yes; in practice, there are physical problems including an unwieldy shape and size [including weight]. 'Banana shaped' [C-band] antennas in the 'simulsat' family have been around from 1981 but to achieve 3m performance at C-band requires a structure between 5 and 6m in "length"; not a backyard device. First, we would suggest, is a *larger* Ku-band version capable of creating more gain than the typical 65cm single-purpose offset dishes the Toroidal replaces.)

AT Sign-off

Coship - again. Last month we reported (p. 4) that it appeared the SF#107 featured Coship 3188C "blind search" IRD was no more; discontinued. NZ importer Peter Escher took exception, promptly obtaining an email statement from the factory, someone named "Rick Lee," at (email address) ligongfan@coship.com saying, "we still build." SF then asked the factory to make statement, *to us*, that the receiver is not only being produced, but will continue to be factory-supported for repairs. Our UK contact, Roger Bunney writing in the magazine TELEVISION for September, said "*Unfortunately, the CDVB3188C is no longer available, as stocks of the onboard processor have been exhausted.*" On warranty repairs, Escher, when asked if he stocks replacement power supplies, said he has other Coship (model) receivers on hand, and, "*they all use the same power supply,*" suggesting that if one failed, he'd rip a new similar product apart to provide a replacement supply. With 1% of all supplies scheduled to fail (p. 20, here), Escher's claim that he has sold "400 of the Coship product" suggests no fewer than 4 will have power supply problems. Our unwanted advice to him was to arrange for a stock of replacement P/S boards; for example, Sciteq and Av-comm and Strong (to name but three firms) routinely plan ahead when introducing a new product, and using the manufacturer's best estimate of failures, maintain an inventory of likely-to-be-required parts on hand.

Asian firms drop models with no warning, potentially leaving buyers without support for the law-setting mandatory one year period. Asian firms also have a marketing strategy of dividing the world into regions, perhaps to allow them to "dump" product which they have left over from a production run going to one "region," into another, without creating marketing problems in the first region.

Escher wanted SF to publish a retraction to our September supposition. We said 'OK - but it is not *you*, the importer who knows the truth here - *it is Coship*. Get us a suitably worded statement from the factory.' The best he could do was "*we still build*" in an email. Not good enough, we responded; our UK and US sources say it is no longer available.

"*Proof?*" demanded Escher. We referred him to the September issue of TELEVISION and the American web site Sadoun Satellite Sales where on September 21 we lifted the following statement.

Coship CDVB3188C FTA Digital Receiver
DVB FTA MPEG2 Digital + BLIND SIGNAL & S/R Search. IR remote

*** Sold Out **

He still wanted an "editorial retraction" and as our attempts to get the factory to directly address this issue to our satisfaction had failed, told him he could "purchase" a retraction (called an advertisement); page 29 here. Had Rick Lee at the Coship factory been more forthcoming, we would have gladly printed a "correction" to our September report.

Meanwhile back on the farm, at least two competitive sources for "all searching, all finding" FTA IRDs appeared. The first is the Innovia, "discovered" by Craig Sutton (www.apsattv.com) and Anthony Dunnett (ImpactTV). As previously reported, Dunnett first tried to import-for-test Coship's 3188C. An email to Dunnett from Coship's Rick Lee, in denying access to his products to ImpacTV, notes, "*Coship has the right to choose partner, which he believes the business can be done more quickly and efficiently.*" Dunnett's order had been "first" to Coship, 50 units. When Escher came along later and offered a bigger order (he claims 400 sold), Coship/Lee cancelled with ImpacTV. The *original* Coship seller, Tim Heinrichs of DMS International in Georgia (USA), had a similar experience; his 4,000 per month was judged too small to continue when a customer of Heinrichs went direct to Coship/Lee asking for 60,000 to be dumped into Iraq (SF#107, p. 31). A late note from Escher at the end of all of this included, "*I am dealing for a big order in Iraq/Libya - interested in a story for SatFACTS?*" Our answer was, no.

Then there is the Powtek. Jason Racic operates as aDigitalife Pty Ltd (www.adigitalife.com) in Queensland and offers a wide range of imported receivers. Jason tells us, "We imported a sample and then sold it after testing. We were very happy with the product but feel the amount of publicity to 'Blind Search' portrays (receivers of this type with) a degree of scepticism. The Powtek remains in the factory until people can respect the receiver for what it does, as opposed to what it doesn't do. We won't be ordering anymore until we have some pre-orders."

The sample he bought, tested and resold went for A$154 and by coincidence was purchased by DX Observer David Leach of NSW. Leach? "*I give it a 10 out of 10 - fantastic!*"

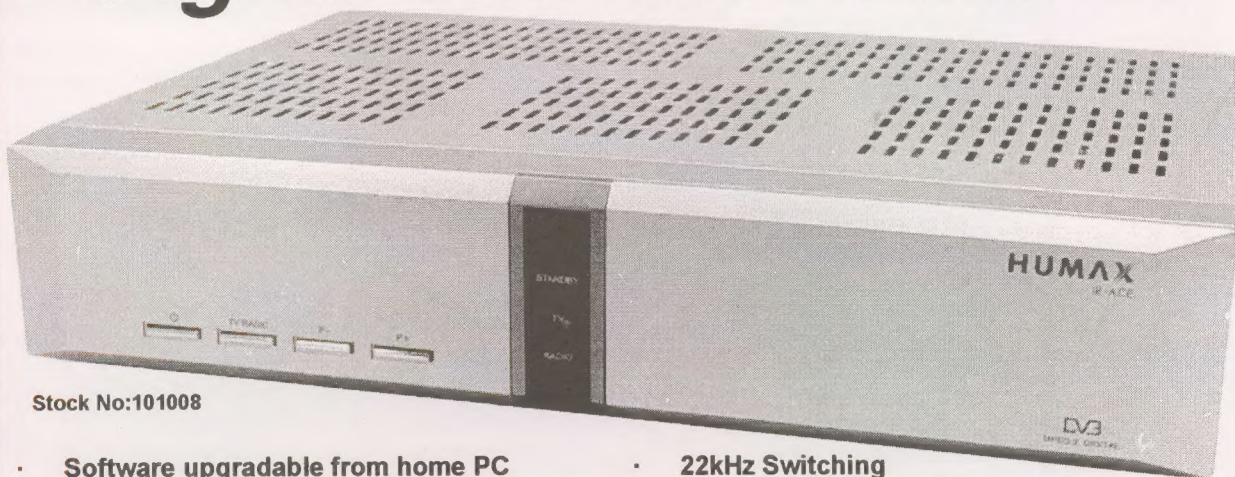
The Innovia and Powtek - are they the same? Not directly. The rear panels are similar but the top case cover differs; the Powtek and Innovia both uniquely have six RCA sockets - L, R and video x 2. And SCART. None of this describes the Coship. Powtek and Innovia claim 3,000 memory channels, Coship's 3188C had 1,000. If all three of these originte(d) at the same Shenzhen facility, logic suggests the 3188C with only 1,000 memory channels would have predated the later 3,000 channel memory units. If Rick Lee's "*We still build*" is a truthful statement, he's behind the times with a SCART-less, low channel number version. Coship, in cancelling the order placed by the UK distributor identified by TELEVISION's Roger Bunney, claimed the processor (CPU) originally used in the 3188C had dried up; no longer available.

Coship in selling to Escher has encouraged the NZ firm to handle a range of their products - there are five listed by Sadoun's web site including a semipro (in appearance) CDVB2000G rack mount version. Only the 3188C featured blind search, incidentally, was on the "must-have" functions list from the 60,000 would-be buyer from Iraq. The ability to plug it in, search and locate everything the antenna delivers was essential to the newly emerging Iraqi market.

Escher: "(My) distributor Telsat is selling a lot of these with buyers from all over the world; Ireland, Sweden for example." So do they exist? Outside of NZ, apparently not. Why NZ, only? Perhaps for whatever reason the warehouse is all but empty and Escher's firm is small enough to chew up those remaining at a rate which Shenzhen can handle.

HUMAX

IR-ACE-S

Digital Satellite Receiver

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- SCPC & MCPC from C / Ku Band
- Supports DVB Subtitling & DVB Teletext
- Electronic Programme Guide

Conditional Access Interface

Irdeto Embedded	1 Smart Card Reader

Tuner & Channel

Input Connector	F-type, IEC 169-24, Female
Frequency Range	950 ~ 2150 MHz
Input Impedance	75 Ω unbalanced
Signal Level	-25 ~ -65 dBm
IF Frequency	480 MHz
IF Band width	36 MHz
LNB Power & Polarization	Vertical: +13.5 V Horizontal: +18 V Current: Max. 500 mA, Overload Protection
22 kHz Tone	Frequency: 22±4 kHz Amplitude: 0.6±0.2 V
DiSEqC Control	Version 1.0/1.2 Compatible
Demodulation	QPSK
Input Symbol Rate	1 - 45 Msym
FEC Decoder	Convolutional Code Rate 1/2, 2/3, 3/4, 5/6 and 7/8 with Constraint Length K=7

A/V & Data In/Out

VIDEO	RCA/Cinch, Video Output (CVBS)
AUDIO R/L	RCA/Cinch Volume and Mute Control (Resolution: 20 bits DAC, Max. 2 Vrms)

Data Port

RS 232C	Transfer rate 115 Kbps 9 pin D-sub Type

MPEG Transport Stream A/V Decoding

Transport Stream	MPEG-2 ISO/IEC 13818
Profile Level	MPEG-2 MP@ML
Input Rate	Max. 15 Mbit/s
Aspect Ratio	4:3, 16:9
Video Resolution	720 x 576, 720 x 480
Audio Decoding	MPEG/MusiCam Layer I & II
Audio Mode	Single channel/Dual channel Joint stereo/Stereo
Sampling Rate	32, 44.1 and 48 kHz
Graphic Engine	3-OSD plane 1-background plane H/W Bit Blit ~16 bits color

RF-Modulator

RF-Connector	75 Ω , IEC 169-2, Male/Female
Frequency	470 ~ 860 MHz
Output Channel	CH21 - 69 for the Remodulator
TV standard	PAL B/G/I/D/K selectable by Menu

Power Supply

Input Voltage	90 ~ 250 VAC ±6%, 50 Hz/60 Hz
Type	SMPS
Power Consumption	Max. 30 W
Stand by	≤9 W

Physical Specification

Size (W x H x D)	260 x 50 x 180 mm
Weight (Net)	1.3 kg

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